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Number 1

Glimpses of Joint Meeting of S.A.F. and C.I.F., Montreal, November 17-20

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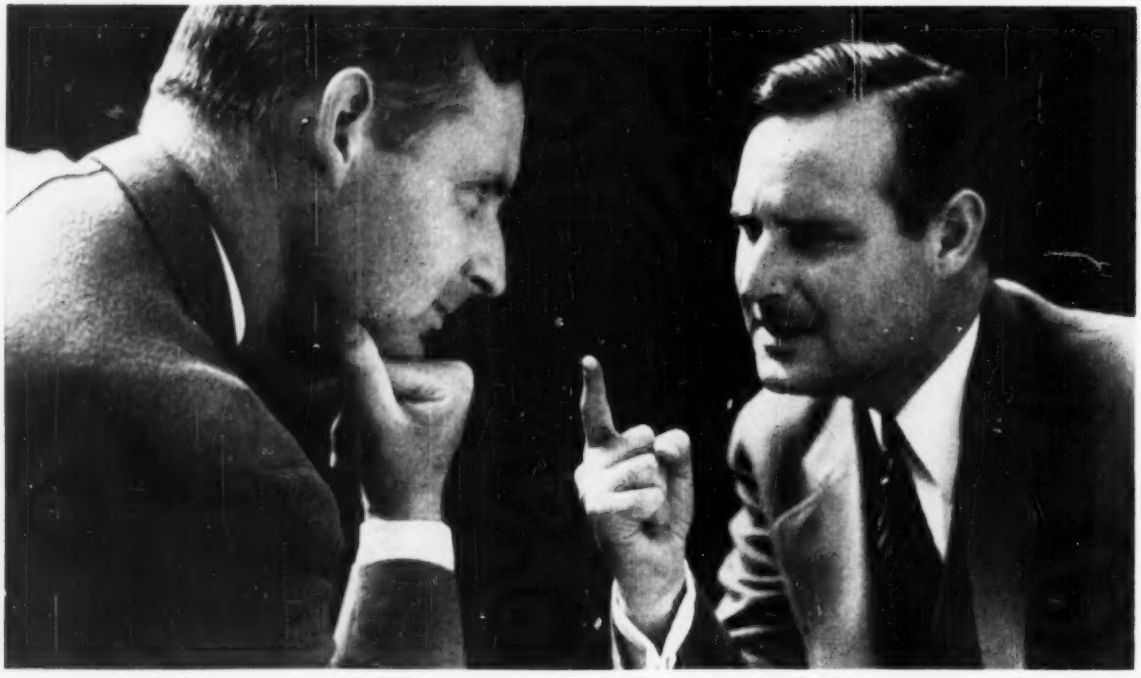

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Journal of Forestry

Official Organ of the Society of American Foresters

The 52nd Annual Meeting

THE SOCIETY OF American Foresters and the Canadian Institute of Forestry met jointly in Montreal, Ontario, November 17-20 with an attendance of 800 members, ladies, and guests. Forty-two states, six Canadian provinces and two European nations, Great Britain and Finland, were represented.

Having as its theme "Trends in North American Forestry," the four-day conference included two general sessions, seven technical sessions, and business meetings of the two professional societies. More than a hundred foresters from the two nations appeared on the program.

C.I.F. president, K. G. Fensom of Vancouver, B. C., officially opened the meeting with an address of welcome which was followed by a response from S. A. F. president George L. Drake of Shelton, Wash. Additional addresses at the opening general session were given by Avila Bedard, deputy minister of lands and forests, Province of Quebec and dean of forestry at Laval University, and by A. W. Bently, consulting forester from Victoria, B. C.

W. A. E. Pepler of Montreal, head of the Woodlands Section, Canadian Pulp and Paper Association, served as general chairman of the conference. J. L. Van Camp, also of Montreal, secretary of the Canadian Forestry Association, served as program chairman.

Technical Sessions

Seven technical sessions were held during the four days of the convention on the following subjects: forestry education; forest management; silviculture; forest economies and taxation; forest utilization; public relations; and recreation, wildlife, and range management.

Presidents Drake of the S.A.F. and Fensom of the C.I.F.

Reports of these technical sessions were presented at the final general session, at which Mr. Pepler presided. The highlights of the meeting were summarized by George A. Garrett, dean of the Yale School of Forestry, New Haven, Conn.

Awards Presented

In behalf of the S.A.F., President George L. Drake presented two awards for distinguished service to forestry. The Gifford Pinchot medal was awarded to Raphael Zon of St. Paul, Minn., former editor of the JOURNAL OF FORESTRY and retired director of the Lake States Forest Experiment Station.

The Sir William Schlich memorial medal was awarded posthumously to the late Ellwood Wilson of Knowlton, Quebec, "the father of aerial forest mapping." Mr. Wilson died in May 1952. The medal was accepted by his son Richard Ellwood Wilson of Saratoga, N. Y., a professional forester.

A third award, a plaque presented annually by the Canadian Forestry Association for outstanding performance in forest conservation, was made to Henri Kieffer, chief of the Forest Protection Service of the Quebec Department of Lands and Forests.

Business Sessions

A get-acquainted reception and dinner for the Board of Directors of the C.I.F. and the S.A.F. Council on November 17 was kindly sponsored by the Canadian Lumbermen's Association.

The two organizations held separate business sessions. At the S.A.F. session the annual reports of the president, George L. Drake, the executive secretary, Henry Clepper,

and the editor were given. A resolution of appreciation to the C.I.F. was adopted and carried by S.A.F. vice president, Elwood L. Demmon, to the Canadian meeting. Seven committee reports were made. (The Society Affairs department of this issue carries a full report of the session.)

Luncheon and Banquet

Following the first general session, a joint C.I.F.-S.A.F. luncheon was held through the courtesy of the Canadian Pulp and Paper Association. R. M. Fowler, president of the association, served as toastmaster and an address was given by Hon. Robert H. Winters, Minister, Department of Resources and Development, Ottawa.

At the joint banquet on the evening of the third day, attended by more than 500 members and guests, K. G. Fensom, president of the C.I.F., served as toastmaster. Presentations of the aforementioned awards was made and a delightful program of Canadian folk songs and dances given by a 4-H club girls' chorus.

President A. W. Trueman of the University of New Brunswick, as the principal speaker of the evening, gave a deeply inspiring address on the significance of the forestry profession as viewed by an educator.

The banquet was preceded by a reception sponsored by the Department of Lands and Forests, Province of Quebec.

Ladies' Activities

The ladies also shared in the hospitable attention of the Canadian hosts. A bus tour of the city, provided by the courtesy of Chas. Cusson Ltd., and a reception by Mayor Camillien Houde and the City of Montreal at the Botanical Gardens highlighted their activities, which also included attendence at the reception and banquet.

Related Meetings

The Association of Consulting Foresters held a meeting prior to the first general session.

Persons interested in public relations met for an informal evening's discussion.

Various alumni groups held reunions.

THIS CONVENTION, the largest international conference of professional foresters ever held in North America, was without doubt one of the Society's most successful annual meetings. The Society is indebted to those of its members whose generous service helped make it a success.

To our Canadian colleagues of the C.I.F., efficient organizers, matchless hosts, we extend our heartiest thanks, our deepest appreciation.

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Trends in North American Forestry[1]

George A. Garratt
Dean, Yale School of Forestry.

A Summary of the Joint Meeting of the Canadian Institute of Forestry and the Society of American Foresters, held in Montreal, Canada, November 17-20, 1952.

THE DEVELOPMENT OF FORESTRY on this continent in some respects resembles the growth of one of the majestic white pines which played such an important role in the early commerce of Canada and the United States. The half-forgotten efforts made to establish the concept of forestry during the 19th century may be likened to the many seeds which are cast down in the virgin forest before one takes root and grows. In the early decades of the present century the ideals represented by our two societies passed almost miraculously through the perils of early life, much as the young pine seedling slowly surmounts the many obstacles to its survival. Today forestry in North America is in a stage much like that of the thrifty sapling, established beyond doubt and growing ever more rapidly with each passing year. We may look forward to a time when advances in forestry may not take place so rapidly, just as the growth of the tree slows to a steady pace, but that time is not yet. Forestry, like a tree, reaches full stature only by the progressive addition of a multitude of small cells; even the increment of a single year cannot be detected by casual observation. As a consequence, it is not surprising that a review of achievements in any, and all, fields of forestry fails to reveal many great strides toward our ultimate goal. The progress we have made is, instead, the sum of a myriad of local accomplishments, each of which fits into the continental picture in its own special way.

[1]Paper given at the final general session, joint meeting of the Canadian Institute of Forestry and the Society of American Foresters, Montreal, Canada, November 20, 1952.

Silviculture

Silviculture in North America is moving rapidly out of the empirical stage into an era of forest production characterized by a constantly increasing application of scientific principles. This trend will continue, and almost certainly gain strength, as more and more operators shift from a policy of exploiting timber stands produced by nature to one of growing their own forest crops.

The desire for immediate profit, long the major objective in past logging operations in North America, coupled with indifference as to the fate of cutover lands, has turned many thousands of acres of highly productive timberland into areas supporting inferior growth or otherwise of low productivity. However, the increasing value of wood and the rapid drain of quality timber have now brought most forest owners to realize the necessity for conservative measures.

And, as such measures gain increasing application in the woods, many operators are learning that silviculture is not the bitter pill of impractical idealism that they had formerly imagined.

There appears to be a growing tendency for foresters to utilize, in the production of forest crops, the methods and the knowledge of the scientific disciplines on which the art of silviculture is based. It augurs well for the future that, in the technical session on silviculture, foresters found in their ranks the talent and interest to discuss such varied subjects as forest genetics, forest soils, forest entomology, timber quality, and forest ecology. It is a healthy trend that the breadth of silviculture is gaining greater recognition and that foresters, becoming increasingly concerned with underlying scientific principles, are making important new contributions in this field.

Years ago silviculture in North America was influenced strongly by European experiences and philosophy. Today foresters in Canada and the United States have themselves accumulated a substantial body of experience, out of which have been developed many new approaches to the production of forest crops. As an example of the trend, we may turn to the young but rapidly expanding field of forest genetics. Early work in this field consisted almost entirely of studies of tree races. Later, interspecific hybridization held the limelight. In the studies on races and on selection the impetus came largely from Europe but interspecific hybridization has been primarily an American development.

Production of forest crops is not an end in itself. The silviculturist is vitally concerned with how the crop is to be harvested and utilized, and the logger and wood utilization specialist can be no less concerned with the problems of forest crop production. It is therefore gratifying to see both of these aspects of forestry treated on the same program, as they were in the symposium on the silvicultural management of the spruce-fir types. In logging and utilization, too, foresters have shown an increasing temper to seek out the methods and principles of engineering and technology which can contribute to a solution of the very practical problem encountered in the woods and in the mill.

Forest Management

Since forest management represents the integrated application of human knowledge to the treatment of the forest, it is logical that progress in this field should be measured in terms of the success of forestry itself.

In the technical session on forest management we heard accounts of a broad sample of the diverse efforts which are being made to ensure sustained productivity of forests in widely separated places. We were told of the steps which have been taken to implement the legislative decision of the Province of British Columbia that the Crown forests should be managed for a perpetual yield rather than for non-recurring revenue. We also heard of similar steps taken in Ontario, where the problem of integrating production of pulpwood and sawlogs is of pressing importance. The forester of a large paper company with holdings on both sides of the international boundary described the organization of a network of many small sustained-yield units, each tailored to size and made of operation to meet the circumstances prevailing in each locality.

The problems of creating a productive forest economy in North America cannot be solved exclusively in terms of large stable ownerships. Some of the most productive forest land is split up in small woodlots—holdings which commonly have all the attributes required for sound forest practice save growing stock and stability of tenure. We have been told of the role which can be played by cooperatives and large forest enterprises in helping the woodlot owner to help himself. Obviously, there is no one best means of organizing forest lands for the perpetual benefit of society. It is, indeed, to the credit of our profession that it has worked out so many different ways of fitting the solution to the circumstances. It would be unfortunate if we were to adopt the attitude that the blueprints of a scheme of sustained-yield administration successful in the Crown forests of Ontario should work as well in the small woodlots of southern New England.

The finest system of organizing forest land for continuous production is doomed to failure unless effort is also directed to the development of satisfactory techniques for the culture and protection of the crop. This problem will continue to demand the utmost in the skill, knowledge, and imagination of the profession. The application of prescribed burning to the management of the hard pines of the Atlantic coastal plain may be cited as an outstanding example of the skillful use of ecological observation in meeting difficult silvicultural problems.

Forest Utilization

The discussions at the session on forest utilization might be considered as a sampling of chapters from an unfinished manuscript, to be entitled, perhaps, "The Reduction of Waste in Forest and Mill; or, How Rising Costs Have Accomplished What Nothing Else Can." Each paper dealt with some of the problems which face the wood-using industries as a result of long-term trends toward poorer stands, higher logging costs, and a demand that every cubic foot of wood yield the maximum dollar return at the mill.

Among the subjects discussed were the reduction of waste and costs in pulpwood operations in eastern Canada, through increased supervision of logging and improvements in water transportation; a conspicuous instance of integration in New England, involving a segregation system for hardwood logs to supply the needs of a paper company and a furniture manufacturer; and the feasibility of laminating oak for subsequent

steam bending to produce curved ship timbers, thereby achieveing more effective utilization of wood.

Finding uses for low-grade material is the biggest utilization problem we face. This problem is especially acute in the Lake states, where more than 30 percent of the hardwood sawtimber volume is now composed of grade 3 logs, suitable only for railroad ties and rough lumber. Unfortunately, this situation is not confined to a single region, for most of our hardwood stands reflect the results of the same process of repeated high-grading, with too much of the residual volume in trees of poor form or species.

An analysis of the effects of recent pulp and paper developments in British Columbia pointed up the happy consequences which may follow the development of new uses for hitherto submarginal trees and logs. A demand for mill waste, for small logs, and for hemlock and white fir pulpwood has contributed to a much more complete utilization of the forest and increased attention to the management of second-growth stands.

Underlying all these utilization papers I find several assumptions —assumptions which in print may strike us as truisms. Perhaps they are, but I submit that the wood-using industries have come a long way to accept these ideas:

(1) The near future will see no change in the gradual decline in the quality of sawlogs available for use. Pulpwood and other forest products are similarly affected by the decreasing accessibility of remaining old-growth stands.

(2) The trend toward higher wages and higher costs at every stage of harvesting and manufacturing operations will not be halted or even slowed by anything short of a full-scale attack on waste and inefficiency wherever they may occur. If this requires investment in new methods or equipment, such investment must be considered as a cost of remaining in business.

(3) Research to retain old uses for wood and to develop new ones is likewise essential to the vigorous survival of the wood-using industries. Confronted by situations such as the poor quality of Lake states hardwoods the wood user who can only rely on traditional methods may well be doomed.

The evidence presented at this meeting suggests that important segments of the wood-using industries are thoroughly alive to these problems and are endeavoring to meet them.

Forest Economics and Taxation

The most significant development in forestry in the United States during the past decade has been the great increase in the practice of forestry on large privately owned timberlands. As compared with the preceding decade of the 1930's progress has been truly spectacular. Although this development has been accelerated by various educational programs including the tree farm and other movements, the basic motivating factor has been that of enlightened self-interest of the timber owners. From the economic standpoint it has become good business to grow timber in the face of a shrinking supply available for annual cutting coupled with an increased demand for lumber, plywood, and paper products.

This supply-demand relationship has promoted a tremendous increase in stumpage prices and resulted in greatly improved utilization of timber in the forest and of logs in the mill. Certain federal tax legislation has also stimulated forest owners to spend more money on the application of forestry. Thus the economic practicability of growing timber by forestry practices has been greatly improved.

In an endeavor to keep the course of public forest policy oriented to changing needs and trends, the Forest Service has recently initiated a comprehensive review of the timber resources of the United States. This is the latest of a number of similar studies conducted in the past at 8- to 10-year intervals.

In appraising the status of the nation's forestry situation, advice and assistance of interested groups have been solicited. However, considering the tenor of comments originating in advisory conferences there is considerable disagreement. The principal objections are aimed at the inclusion of a survey of forest management practices. In addition, some groups seriously question the timeliness or value of the entire study, since the incompleteness of the present forest survey would lead to estimations verging on guesses. There is general agreement on the wish to know the true facts but in view of the wide disparity between figures of previous reviews when compared with actual survey data, there is skepticism that the new timber resources review will accomplish its avowed purpose.

Canada, also, is aware of the need of appraising its forest policy in view of changing economic conditions. As in the United States, there is need for greater public understanding of forest land values in the general economy. Realization of "the greatest good to the greatest number" cannot depend entirely upon current economic expediency.

Canadian forest policy is primarily concerned with state-owned forests, since about four-fifths of the accessible timberland is under Crown ownership. However, this ownership system in itself does not constitute the main problem of forest management.

Established industry has had a considerable effect in shaping Canadian forest land policy over the years, through its influence upon legislation and regulations. The resultant changes in the approach to forest management on Crown and private lands indicate that legislators now recognize the need for a sustained-yield forest policy.

Range, Wildlife, and Recreation Management

General increases in population, amount of leisure time, and standard of living of the people have resulted in greater demands for range, wildlife, and recreational use of the forest, and have empha-

sized the need for accelerated effort to integrate these uses with timber production. This can be done in most instances, but it will require skillful application of multiple-land-use principles.

Progress in coordinating livestock grazing with other uses on more than half the forest land of the United States has been relatively slow, due to radical dissimilarities in natural and economic environment in different sections of the country. Years of excessive grazing on forest land in the West, together with adverse climatic conditions, have led to severe deterioration of plant cover and accelerated erosion on many areas. Further problems have centered around the conflict of interests of range users with measures necessary to build up an already depleted resource. However, there is an obvious trend toward replacement of past "rules-of-thumb" by scientific management in meeting present and future needs of the region.

Forest range grazing in the South has recently achieved recognition as a major land use. There is every indication that this will become an increasingly important industry, for it is now being fostered through carefully planned integration of forest and range practices. However, this is not the case in the eastern hardwood region, where we still need a well-coordinated program of land use, either by reservation of land specifically devoted to grazing or through the multiple use of woods areas.

The decreasing trend in certain valuable wildlife populations, coupled with a rise in the use of this resource from both a commercial and recreational standpoint, has focused attention on the interrelationships of the forest both as a wildlife habitat and as a producer of commercial timber crops. Silvicultural practices, in altering the supply of food and cover, have an important influence in regulating numbers of various species of wildlife.

In the past, coordination of forest use for wildlife as well as timber production has been beset with difficulties stemming from the conflict of individual versus social values. The private owner has been dubious of his individual returns from socially desirable practices recommended by governmental wildlife agencies. Resolving these difficulties has been slow, particularly on private lands, although some progress is being made on government land. Notable in this regard is the classification of the state-owned Central Wisconsin Conservation Area into forest, wildlife, and multiple-use management areas, thus clarifying coordination of management for best possible yield of both timber and game.

Changing social and economic conditions have led to increased recreational pursuits. Recreation in the United States has become big business, with more than 12 billion dollars spent annually on vacation and holiday travel. Better transportation and increased leisure time direct an increasing use of forests for this purpose. More than 150 million people were attracted to American national and state parks and recreation areas in a single recent year. Not only do people frequent the readily accessible areas in large numbers, but there has been a marked increase in the number who prefer wilderness tracts where travel is limited to more primitive means. In 1951 about 45,000 persons travelled the waterways of the roadless areas within the Superior National Forest where a system of land-zoning has assured an equitable allocation of forest uses.

Similar trends in recreational use are to be found in Canada. During the past 40 years the British Columbia Provincial Park System has grown to 62 areas comprising over nine million acres. To care for the increased recreational facilities needed on these lands and others administered by the Forest Service, appropriations for 1952 have been substantially increased. In addition, studies and surveys are to be made which will serve as a basis for planning full utilization of recreation and wildlife potentials.

Forestry Education

In no phase of the progress of forestry in North America have trends been more persistent and more clearly marked than in forestry education. We have progressed a long way since the start of our educational program more than 50 years ago, since the days when, lacking any significant American experience, the character and scope of our instruction was largely patterned upon time-honored European methods.

The early objectives of our educational program were largely concerned with training American foresters for a more orderly harvesting of the still vast existing stands of virgin timber. Only in those parts of the United States which had already entered the transition stage from a virgin-timber to a second-growth economy was early attention focused on some of the problems concerned in growing timber as a crop. There developed a somewhat orthodox forestry training which, in the United States, was largely shaped by the requirements of the federal Forest Service, then virtually the only source of professional employment. At a somewhat later date came the development of the multiple-use concept of forestry, and attendant concern for training men for the handling of such wild-land resources as forage and game. And, finally, as private forest owners have developed more acute awareness that future timber supplies must come from lands now in their ownership, and as industry has recognized the need for improved utilization practices, the forestry schools have come to serious reconsideration of their objectives and curricula, with the intent of meeting the varied needs of the increasing number of men going into private forestry.

The developments in our educational process which have come with the years were initially imposed upon the classical course of

study generally adopted by the early schools of forestry. With the passing years, as new curricula were conceived in such specialized fields as logging engineering, wood technology, range management, and wildlife management, they have been established within the general framework of the existing educational structure. This has been done largely by deleting more and more forestry subject matter from the prescribed course of study until today these specialized programs bear little or no resemblance to the conventional forestry curriculum. Whether or not these newer programs qualify as forestry curricula is a matter of current dispute which will not be entirely resolved until we reach agreement as to the area of learning that forestry, in an appropriate modern concept of the term, should encompass.

From the beginning of forestry education in North America we have recognized three basic attributes of a professional curriculum: (1) general education to prepare the student for the responsibilities he shares with all his fellow men; (2) thorough preparation in the sciences basic to forestry; and (3) adequate training in professional subject matter. But, with the progressive accumulation of professional knowledge, a great wealth of material became available for use in forestry education, and continuing pressure has been exerted to increase the time spent on technical subjects. The resultant tendency has been to expand our professional instruction at the expense of basic scientific courses and subjects of cultural value. However, recent revaluations of North American forestry education, not only in the area of forest production, but in those curricula which have grown out of the more traditional forestry programs, have revealed some trend toward a strengthening of all three of the basic attributes. How this may be accomplished within the available time limits of a four-year undergraduate program is perhaps the major problem facing educators today.

Whatever the content of the adjusted curricula may be, it is imperative that they be such as to attract to the forestry schools the most promising young men in the United States and Canada, and then equip these men adequately for their life work in their chosen profession. Our educational program must be dynamic, geared to the constantly increasing standards of general as well as professional education, and responsive to important shifts in methods, policy, or emphasis, brought about by economic conditions, new scientific developments, or other causes. If forestry education is to meet the challenge of the future, it must be clearly established on the professional, not the vocational, level. These are problems which call for the attention of the entire profession, not just those engaged in forestry education.

Present day forestry education is concerned not only with professional instruction, but also with sub-professional training and with extension education. A number of ranger schools in Canada and the United States are offering training which is intended to bridge the gap between the untrained woodsman and the professional college-trained forester. This ranger school training should be essentially practical in nature, but at the same time sufficiently technical to provide the trainee with sound reasons for the approaches and techniques he uses; it should bring the graduate to the point where he speaks the same language as the professional forester and can appreciate the professional standpoint. Ranger school training is a distinct and separate phase of forestry education and not to be considered as a substitute for, or a shortcut to, professional training at the university level. The evidence points to the fact that ranger school graduates are serving to complement professional foresters, not to compete with them.

Not to be overlooked in our overall educational program is the necessity for education of the public which is being called upon to support our forestry program at the state, provincial, and national level. Failure of professional foresters to stimulate the interest of the public by providing more "show windows," in the form of practical demonstrations of tree planting, thinning operations, and other approved practices, is partially responsible for the slowness with which the knowledge of forestry is grasped by the public. Field demonstrations and trips, and provision of factual material and visual teaching aids for both youth and adult groups should be considered by foresters as top priority items in educational programs for the public. From the "show window" stage to full "department store" forestry, where the public can see, approve, and cheerfully pay for good forestry, is a most desirable educational trend in North American forestry, and one which it is the duty and privilege of all foresters to develop.

Public Relations

Whether dignified as "education" or condemned as "propaganda," public relations work has long been one of the American forester's chief jobs. How effective past public relations activities have been we may judge by their results. There has been notable progress in changing public attitudes toward fire and in a few other respects. By and large, however, the ground still unsurveyed far exceeds that won, and its extent may be gauged from some of the misconceptions about conservation and forestry to which many Americans stubbornly cling: The notion that any use of wood is a sin against conservation; that clear-cutting is synonymous with forest devastation; or that wood will soon be completely obsolete in the brave new world of plastics.

In attempting to create a public opinion sympathetic to the problems of wise forest use, foresters face a distinct challenge. The elements of this challenge reflect the increasing complexity of the truths about forestry which we try to

W. A. E. Pepler, vice president of the Canadian Institute of Forestry and general committee chairman for the joint S.A.F.-C.I.F. meeting in Montreal, has an attentive listener in Dean George Garrett, Yale School of Forestry, whose summary of the meeting appears herewith.

teach and of the techniques which we use in that teaching.

Fifty years ago it was enough to cry that out timber resources were not inexhaustible. Today we see the truth as something different, but not the simple opposite of the old statement. Then we could paint a picture of fire in the woods using only unrelieved black. Today's knowledge requires other colors as well. I think it a measure of our growing professional maturity that we have begun to deal with complex truths in public relations—not only with respect to fire but also in considering questions of forest policy.

The papers on public relations presented at this meeting all reflected the increasing difficulty of communicating the forestry message effectively. At a time when one of our papers was entitled "Television and Forestry," this difficulty in communication must be recognized as one of the great paradoxes of our age. The heart of the problem was clearly implied by the words of one of our speakers: "It is never safe to equate mass distribution of information with mass absorption of information."

The last ten years have seen foresters acquire a growing mastery of the tools of effective communication. Public relations work is increasingly recognized as being a crucial part of sound forestry, especially in democratic societies where public opinion so often participates in the shaping of forestry policies. We may look forward to greater successes in public relations, I believe, from an awareness—born of experience and maturity—that we no longer are selling simple truths in simple fashion.

Controversy and Growth

The variety of subjects which we have discussed at this meeting is a measure of the variety of activities by which we are extending and intensifying the practice of forestry in North America. I think it appropriate to conclude this summary by restating one of the common obligations which each of us shares with his colleagues, regardless of the nature of his job or the signature on his paycheck. That is the obligation to conduct our controversies on a professional plane, befitting our growing strength and stature as a profession in America.

Our growth has taken place in a climate of free inquiry and open argument. Obviously, the elimination of this climate would be as tragic for our profession as for all the other segments of our two nations. So I do not plead for an end to controversy or that its expression be minimized at our meetings. Nor do I suggest that our controversies are limited to questions of forest policy—as those who attended the silviculture session at this meeting can testify. As scientists we know that we shall never plumb the depths of our ignorance, and as practicing foresters we know that imperfect knowledge plus the conflicts inherent in our societies will always generate controversy.

I do submit, however, that there is little virtue in argument merely for its own sake. We can also agree, I am sure, that we can seldom persuade an opponent by insulting his intelligence or belittling his motives. The course of wisdom here lies in tempering our zeal with humility, a humility born from a renewed awareness that as foresters we share great responsibilities to society. We can be proud of the way we have come in the last fifty years, but we are neither so wise nor so powerful that we can dispense with the help of any person or group in attacking our basic professional challenge: the wise use of our forest resource. To the extent that we profit from this doctrine, our controversies will be as productive of good in the future as they have been in the past.

Conclusion

In spite of well-nigh endless disagreement over the means, there is no question that the goal of our profession has been, and will continue to be, the conversion of the North American forest to a condition sufficiently productive to sustain in perpetuity the needs of our ever-increasing population. To this end, all foresters can and must contribute. The task is great, but so is the necessity and so are the rewards. With increasing understanding and application of biological principles as they relate to forest production in its many aspects, and with increasing use of technological skills in harvesting and utilizing the crops, we should succeed ultimately in attaining our goal.

Zon and Wilson Honored at Montreal By Awards of Pinchot and Schlich Medals

Presentation of the Gifford Pinchot Medal to Raphael Zon by George L. Drake, President Society of American Foresters November 19, 1952

At the golden anniversary meeting of the Society of American Foresters, held in December 1950 in Washington, D. C., there was made the first award of the Gifford Pinchot Medal. This medal, generously donated by Mrs. Pinchot as a mark of her long friendship to the Society and her interest in forestry, is to be awarded periodically by the Council in recognition of eminent service to forestry or to any phase of the broad field of natural resource conservation in the public interest.

The first United States citizen to become a professionally educated forester, Mr. Pinchot with his technical knowledge, his constructive energy, and his boundless enthusiasm provided needed drive and direction to the advancement of forestry. He was the founder and, for the first eight years, president of the Society of American Foresters.

Henry Solon Graves, Mr. Pinchot's lifelong friend and fellow forester, was the first recipient of the medal. The second person to receive it is another eminent forester who was also Mr. Pinchot's good friend as well as his frequent adviser and occasional amanuensis. Their close personal and professional association covered a span of four decades. It is especially appropriate, therefore, that the recipient is one who enjoyed the friendship and confidence of the great American in whose memory the medal is now bestowed.

Raphael Zon is both a product and an exemplification of American democracy. Born December 1, 1874 in Simbirsk, Russia, he came to the United States as an immigrant in 1897, becoming a naturalized citizen in 1903. He had previously received the bachelor of arts and bachelor of science degrees in his native country, and studied natural sciences, political economy, and philosophy at universities in Belgium and London. He received his professional forestry degree from Cornell University in 1901.

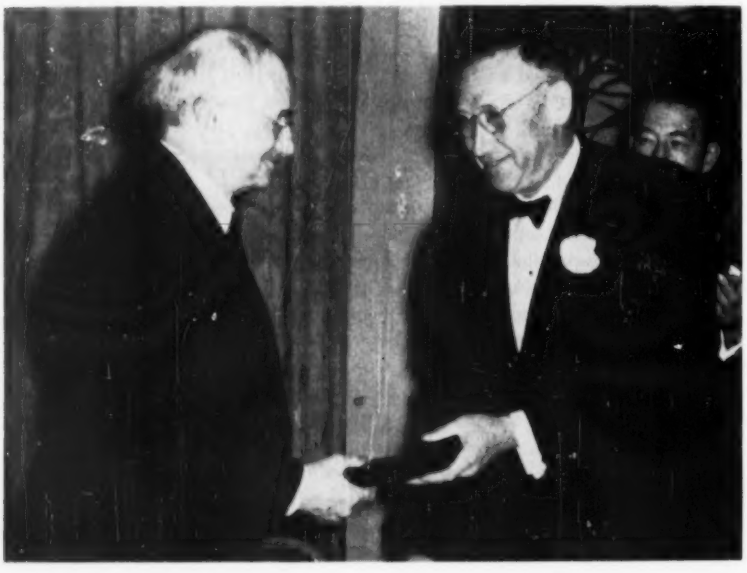
In that year Mr. Zon entered the Forest Service, U. S. Department of Agriculture, as a student assistant and was assigned to forest investigations. Six years later he was made chief of the Office of Silvics, and in 1920 was put in charge of special investigations in forest economics. In 1923 he organized and became director of the Lake States Forest Experiment Station at St. Paul, Minnesota, the official position he filled with distinction and to the notable advancement of forest research until his retirement in 1944.

Mr. Zon's published contributions to forestry literature total two hundred titles. Much of his writing reflects not alone broad scientific knowledge, but a keen philosophical concept of the importance of forestry to human welfare. Had he never written another thing, his name will long be remembered for the book, *The Forest Resources of the World*, compiled in collaboration with William N. Sparhawk, and published in 1923. It was the first attempt to make a systematic and accurate inventory of the earth's forests.

A pioneer in the study of the relation of forests, streamflow, and flood control, Mr. Zon set forth his findings in 1927 in a bulletin, *Forests and Water in the Light of Scientific Investigation*. At first violently attacked, his theories are now widely accepted. Another project which developed early criticism but which finally received widespread approval was the Great Plains shelterbelt planting program started in 1934. An enthusiast about shelterbelts, he helped plan the project and was in charge of the technical phases of its development.

Throughout his official career Raphael Zon exercised a national influence on the development of forest research not surpassed by any other American forester. But it is not alone Mr. Zon's achievements as a government forester, important and valuable as they have been, that merit the award of this medal.

With the late Bernhard E. Fernow, Mr. Zon helped establish our periodical forestry literature. He



←■ Presentation of Gifford Pinchot medal to Raphael Zon (left) by President Drake.

served on the editorial board of *Forestry Quarterly* from 1905 until it was merged with the *Proceedings of the Society of American Foresters* in 1916 to become the JOURNAL OF FORESTRY. At the same time he was editor of the *Proceedings* during most of its existence from 1905 to 1916. When the JOURNAL OF FORESTRY was launched in 1917 he was its managing editor, and served in that capacity until 1923 when he succeeded Dr. Fernow as editor-in-chief, which position he then held for five years.

To Raphael Zon, a great editor as well as a great writer, is largely due the stimulating leadership that the JOURNAL OF FORESTRY has exercised in the advancement of the profession in America. Over a period of twenty-five years, his editorial work was characterized by high ideals, tolerant understanding, unfailing good judgment, and a belief that truth will emerge from the clash of divergent opinions.

Raphael Zon, in behalf of the Society of American Foresters I have the honor of presenting to you the Gifford Pinchot Medal "for outstanding service to the profession of forestry." You have truly earned it, and may it long serve as a reminder of the respect and affection in the hearts of your many friends and colleagues.

Posthumous Presentation of the Sir William Schlich Memorial Medal to Ellwood Wilson by George L. Drake November 19, 1952

To recognize the distinguished services to forestry rendered by the late Sir William Schlich (1840-1925), inspector general of forests in India and later professor of forestry at Oxford University, his friends and colleagues throughout the English speaking world started in 1926 to raise funds to establish the Sir William Schlich Memorial Foundation.

The trust fund of the Foundation is in the custody of the Empire Forestry Association with headquarters in London. The annual proceeds from the fund are awarded in rotation to the various forestry agencies and societies in the British Commonwealth and the United States.

For the United States, the Society of American Foresters was designated as custodian of the award. Sir William had been an Honorary Member of the Society. In subscribing to the fund, foresters in America gave recognition to Sir William's many contributions to the practice and technique of forestry, especially through his monumental book, *Manual of Forestry*, published in 1889, which was widely used during the early developmental period of North American forestry.

In 1932 the United States received its first grant from the foundation. The Council of the Society of American Foresters used the proceeds to finance the design and casting of a medal—the Sir William Schlich Memorial Medal—to be presented from time to time to individuals or organizations in recognition of high achievement in the advancement of forestry.

The first award of the Sir William Schlich Memorial Medal was made in 1935 to the late President Franklin Delano Roosevelt for his services to conservation. Gifford Pinchot, founder and first president of the Society of American Foresters, received the second award in 1940. Subsequently, the medal was awarded as follows: to Henry Solon Graves in 1944; to William B. Greeley in 1946; to Herman H. Chapman in 1948; and to Ralph S. Hosmer in 1950.

In behalf of the Society, I now have the honor of presenting the seventh award of the medal. My great pleasure in making this presentation is understandably tinged with sorrow. For it is a posthumous award; the great forester, whose achievements we had planned to recognize on this occasion, died on May 24, 1952.

Ellwood Wilson was born in Philadelphia, February 16, 1872. He attended the University of the South at Sewanee Tennessee, and received the bachelor of arts and bachelor of science degrees in 1893.

The late Ellwood Wilson.

Subsequently, he studied civil engineering at the University of Pennsylvania, and took postgraduate courses at Fresenius Laboratory in Germany and the Jenner Institute in London.

Following practice as a consulting engineer during the period 1901-1907, in the latter year he was appointed chief forester of the Laurentide Company at Grande Mere, Quebec, a post he held for twenty-five years. While with Laurentide, he rendered notable service to the Spruce Production Branch of the Imperial Munitions Board during World War I; and in 1919 organized Fairchild Aviation Ltd., becoming this company's first president, which office he held until 1929.

An early aviation enthusiast, Ellwood Wilson may rightfully be called "the father of aerial forest mapping." As a pioneer in the use of aircraft for forest fire detection and in the development of techniques in aerial surveying in Canada, he would deserve to be honored for that work alone. But he initiated many additional advancements in the art and science of forestry.

He was responsible for organizing Canada's first forest protective association—the St. Maurice—and early began experiments in the growing of plantations for pulpwood.

In 1932 Mr. Wilson was appointed acting professor of silvicul-

ture at Cornell University where he served until 1934; in that year he started a consulting forestry practice at Knowlton, Quebec, in which he remained active until his death.

Past president and director of the Canadian Forestry Association, Mr. Wilson was a co-founder of the Canadian Society of Forest Engineers (now the Canadian Institute of Forestry), and was a founder and past chairman of the Woodlands Section, Canadian Pulp and Paper Association. He became a naturalized citizen of Canada in 1927. A Member of the Society of American Foresters since 1915, Mr. Wilson was elected in 1949 as a Fellow, the highest membership honor the Society can bestow.

Although we deeply regret that Ellwood Wilson cannot personally accept this medal, I am happy to present it to his son, Richard Ellwood Wilson, also a professional forester.

Mr. Wilson, with assurances of the high regard in which the foresters of Canada and the United States hold the memory and accomplishments of your father, accept this Sir William Schlich Memorial Medal for his distinguished services to forestry.

Accuracy of Land-Use Classification and Area Estimates Using Aerial Photographs

R. C. Aldrich
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IN SURVEYS OF FOREST LAND, whether conducted by timber owners or federal agencies, one of the most troublesome questions is, "How accurately can land use be classified on aerial photographs and what intensity of ground checking is needed to achieve the degree of accuracy required?" In the periodic resurveys of states conducted by the Forest Survey, the problem of distinguishing accurately between forest and nonforest land is particularly troublesome and particularly important. Since the time the aerial photographs were taken, idle land frequently becomes stocked sufficiently to be classed as forest, and forest land is often cleared so that it becomes agricultural. Despite this difficulty, the distinction between forest and nonforest land is the key to forest surveys, since forest volume, growth, stocking, and drain data must be based on accurate estimates of forest area.

Using single aerial photographs for land-use classification in the resurvey of southwest Georgia, we found four principal reasons for inaccuracy: (1) errors caused by using old photographs, (2) errors due to the season of the year during which the photographs were taken, (3) errors caused by the photo interpreter, and (4) errors due to the limitations of aerial photographs.

The accuracy objective used for the forest area estimate was ±1 percent, in terms of one standard error, per million acres. On the basis of total forest area in the unit, this would mean an error of ± .57 percent. To meet this objective, a system was established which involved (a) determination of land-use areas from a count of photo grid plots on aerial photographs supplemented by field checks of selected nonforest plots and (b) ground checking of forest plots drawn from the photo grid in a systematic manner.

Photo Classification Procedures

Standard 1/20,000 scale Production and Marketing Administration photographs were used. These photographs were two and three years old with the exception of two counties where only eight-year-old photographs were available. The seasons of photography were winter and early spring. Interpretation was done with only occasional use of a magnifying glass in doubtful cases. Overlapping photographs were not used for stereoscopic examination.

Using every third photograph in alternate flight lines, an average of 68 percent of each county was covered. A grid of one-acre plots was printed on the emulsion side of each photograph. The number of plots on this grid was dependent upon the number of photo classifications required, which, in turn, was controlled by the percent of forest land, accuracy objective, and gross area in the unit. In southwestern Georgia, which is 54 percent forest, a 72-plot photo grid was used. This resulted in 51,242 land-use plots, each representing 110.6 acres of gross unit area.

Land area was divided into seven classes: (1) forest, (2) active agriculture, (3) idle agriculture, (4) pasture, (5) non-census water, (6) marsh, and (7) urban and other. The photo interpreter examined each 1-acre grid plot within a county and recorded it under the appropriate class heading on a land-use classification form designed for this purpose. Plots were classified according to the land use at the plot center. If a plot center fell in an area less than 1 acre in size and 120 feet wide the plot was classified according to the surrounding area.

Selection of Ground Sample Plots

Ground sample plots are necessary to obtain forest volumes and other pertinent information regarding the forest growing stock, and to make corrections in the preliminary photo area estimates called for by changes in land use and misinterpretation.

Forest ground plots were drawn from the classification forms using

a selection interval. This interval was derived by dividing the total number of forest photo grid plots by the number of forest ground plots required.[1] Nonforest classifications were selected at this same interval but only 10 percent of the active agriculture and 33 percent of both the pasture and idle agriculture plots selected were sampled. If this intensity did not produce at least 6 plots in each class, per county, then additional plots were selected at random to give this number. For the 22 counties in southwest Georgia 1,547 forest, 226 active agriculture, 138 pasture, and 191 idle agriculture plots were selected for ground sampling.

The intensity of this ground sample is best illustrated by the number of acres represented by each plot, and the percent of the total number of photo grid plots checked.

Sample class	Number of acres per plot	Percent sample of photo grid plots
Forest	2,051	5.4
Active agric.	8,621	1.3
Pasture	733	15.0
Idle agric.	1,499	7.4
All classes	2,620	4.1

Each ground plot selected was circled on the aerial photographs and given a consecutive number for each county. Field men then visited each of these locations and recorded the essential survey data pertaining to the forest growing stock. They also indicated whether a change in land use had occurred, and, if so, what caused the change.

Accuracy of Land-Use Classification

There were 2,102 ground plots examined and of these 340, or 16.2 percent, were misclassified. Four and one-half percent of the forest plots were wrong, 11.9 percent of the active agriculture, 73.9 percent of the pasture, and 73.8 percent of the idle agriculture.

Of the total number of plots called forest, 1.6 percent were classified incorrectly because the interpreter overestimated the percent of tree stocking on idle and pasture land—10 percent stocking means forest land. About 1 percent of the forest plots turned out to be active agriculture, because the land-use class at the exact plot center was concealed by shadows or displacement of tree tops along field boundaries. Conversion of forest to agricultural uses introduced a 1.7 percent error. Failure to distinguish accurately the boundaries of forested cemeteries, school grounds, and other urban developments resulted in the misclassification of 0.2 percent of the forest plots.

TABLE 1.—REASONS WHY NONFOREST PLOTS WERE MISCLASSIFIED

Reason for misclassification	Active agriculture	Pasture land	Idle land
	Percent	*Percent*	*Percent*
Change in land use since photography	11.1	39.9	61.8
Season of year	0.4	26.8	8.9
Underestimating tree stocking	0.0	0.0	1.6
Interpreter errors	0.4	7.2	1.5
Percent of total plots misclassified	11.9	73.9	73.8

The accuracy of nonforest land classification is influenced most by changes in land use since the photographs were taken. This is especially true in the case of idle and pasture land, which is relatively unstable (Table 1). The use of winter cover crops and, in some instances, the ingrowth of weeds and wild grasses on active agricultural land also introduces seasonal effects that result in the misclassification of a rather high proportion of the the idle and pasture land. Inability to see young seedlings on idle land is also a source of error. And finally, there is some land that cannot be classified correctly because the interpreter is unable to determine the use by inspection of the photograph. Fringe areas around urban developments fall in this category.

The errors in land-use classification as given here may not apply in other sections of the country. Changes in land use since the date of photography may not be the cause of such large errors in parts of the country where agricultural and forested areas are more stable and agricultural uses regulated to a greater degree. However, under similar conditions and using the same definitions for the land-use classes, season of the year, underestimating tree stocking, and interpreter errors should result in comparable errors but will depend to a great extent on the experience of the interpreter and his knowledge of the ground conditions present.

Accuracy of the Area Estimates

The error of the final estimate of the forest area in the unit was ±.70 percent, or 21,400 acres (Table 2). This means that the chances are two out of three that the true forest area is within 21,400 acres of the 3,057,500 estimated. The highest error for county forest area estimates was ±4.8 percent and the lowest ±2.3 percent.

Errors for the adjusted active agriculture, pasture, and idle agriculture estimates are given to illustrate the degree of accuracy ob-

TABLE 2.—PRELIMINARY AND ADJUSTED LAND-USE AREAS AND THE ERROR OF THE ADJUSTED ESTIMATE

Land use sample class	Preliminary area estimate	Adjusted area estimate	Error of the adjusted estimate in terms of 1 standard error
	M acres	*M acres*	*Percent*
Forest	3,172.5	3,057.5	± .70
Active agriculture	1,948.3	1,954.9	± 2.28
Pasture	101.2	135.5	±18.77
Idle agriculture	286.2	312.2	±11.79

[1] The number of forest samples required in a county was computed to give board-foot volume estimates within a standard error of ±10 to 15 percent. This sample also had to satisfy the national accuracy objective of less than 5 percent error per billion cubic feet of growing stock.

tained by the Forest Survey using a relatively small ground sample in these classes. The areas of active agriculture and pasture land are not essential to the survey as such, but are important because they make up a large part of the total nonforest area. An estimate of the idle or abandoned agriculture land available for forest tree planting program is desired and the error of this estimate should be kept to a minimum.

The large error in the idle agriculture class was due primarily to the small sample of active agriculture plots, each of which represented 8,621 acres. Plots shifting to the correct idle classification carried too much acreage in comparison to that carried by idle plots when they shifted to other classes. Thus, by increasing the active agriculture ground samples from 226 to 1,300 plots, with each plot representing about 1,500 acres, the error of the idle agriculture area would decrease to ±6.4 percent. Although this increase in active agriculture plots would place area shifts between classes on a more equal level, 600 plots would have resulted in the most reasonable error with the least number of plots. This sample would reduce the error to ±8.06 percent. Any further increases in the number of samples resulted in only a small increase in accuracy. Increasing the samples of pasture and idle agriculture land has no appreciable effect on the error of the adjusted idle agriculture area.

Ground Sample Required to Obtain Accuracy Objective

With the ground sample of nonforest and forest plots used on the resurvey, the error of estimate of the forest area was ± .70 percent instead of the objective of ± .57 percent. The problem now is what intensity of sampling would be required to attain the accuracy objective.

With a larger nonforest sample.—On the resurvey the following proportions of the nonforest plots classified on the photographs were checked on the ground: 1.3 percent of the active agriculture, 15.0 of the pasture, and 7.4 percent of the idle agriculture. The total number checked was 555. Changes in classification brought about by these checks, coupled with the changes found on the check of forest plots, resulted in the error of ±.70 percent. However, none of the active agriculture plots checked were found to be forested and therefore they contributed nothing to the error of the forest land estimate. In other words, the error of forest land would have been the same if no active agriculture plots had been checked.

In order to measure the effect of a more intensive ground sample of nonforest plots, the sample of forest plots was held constant and the ground sample of pasture and idle agriculture plots was increased by regular percentage intervals. In this analysis we assumed that the percent shifts between land-use classes were the same as occurred with the smaller sample. For this reason no active agriculture plots were included. The results show that increasing the number of nonforest ground samples would be unwarranted, where total forest area is the primary objective, as doubling the number of plots only reduced the error by ±.02 percent (Table 3).

TABLE 3.—EFFECT OF CHANGES IN NONFOREST SAMPLE INTENSITY ON THE ERROR OF THE FOREST AREA ESTIMATE

Sample of photo grid plots by classes		Total nonforest samples	Error of the adjusted forest area
Pasture	Idle agric.		
Percent	*Percent*	*No. plots*	*Percent*
15.0	7.4	329	±.70
20.0	10.0	442	±.69
30.0	15.0	663	±.68
40.0	20.0	883	±.68
50.0	25.0	1,104	±.68

TABLE 4.—EFFECT OF CHANGES IN THE FOREST SAMPLE INTENSITY ON THE ERROR OF THE FOREST ESTIMATE

Sample of total forest grid plots	Forest samples	Error of the adjusted forest area
Percent	*No. plots*	*Percent*
5.4	1,547	.70
6.0	1,721	.68
7.0	2,007	.65
8.0	2,294	.63
9.0	2,581	.61
10.0	2,868	.59
11.0	3,155	.58
12.0	3,441	.57

With a larger forest sample.—Another alternative would be to increase the number of forest plots checked on the ground, and not increase the intensity of the nonforest sample. These additional forest plots would merely be inspected for conversion to nonforest use, since the number of forest plots cruised was sufficient to provide volume estimates to the required degree of accuracy.

The analysis shows that it would be necessary to increase the number of forest sample plots from the 1,547 taken on the resurvey to 3,441, before the error of the adjusted forest area would meet the accuracy objective (Table 4). Thus, 1,894 more forest plots would have to be checked. Such a large increase in field work could seldom be justified.

With the smallest total number of samples.—The largest part of the error in the forest area estimate was due to forest plots converting to nonforest. Therefore, any practical method of decreasing the error would have first to reduce the error from this source, which means taking more forest plots. The smallest total number of plots necessary to reduce the error to ±.57 percent was obtained by adjusting the number of forest and nonforest plots simultaneously. The optimum combination was assumed

TABLE 5.—GROUND SAMPLE REQUIRED TO ESTIMATE FOREST AREA WITHIN ±.57 PERCENT WITH THE SMALLEST NUMBER OF PLOTS

Sample class	Ground samples	Sample of total grid plots	Increase in sample	
	No. plots	*Percent*	*No. plots*	*Percent*
Forest	3,052	10.6	1,505	49.3
Pasture	145	16.1	7	4.8
Idle agriculture	365	14.2	174	47.7
Total	3,562	7.0	1,686	44.5

to be the one that yielded an error of exactly ±.57 percent with the smallest number of plots of all kinds.

This analysis resulted in 3,052 forest plots, 145 pasture, and 365 idle agriculture plots (Table 5). This represents an increase of 1,505 forest plots. Seven more pasture plots and 174 more idle agriculture plots were required, but since it was unnecessary to take any active agriculture plots, 45 less nonforest plots were needed. The total increase for all classes is 1,460 plots, or 434 less than needed if we increase only the forest plots. Although the forest area estimate would be within the specified objective, the increase in field work is still too large to be justified for such a small increase in accuracy.

Summary

During the forest survey of southwestern Georgia, single aerial photographs were found adaptable for accurate forest area estimates. From this survey it was concluded that the accuracy of the land-use classification depended to a great extent on the accuracy of the photo-interpreter, the age of the photographs used, and the season of the year during which the photographs were taken.

One of the main sources of error in forest land classification was the inability of the interpreter to determine correctly the percent stocking of forest trees on idle agriculture and pasture land. Faulty determination of plot center locations also contributed a large portion to the error in forest land classification.

Age of the photographs and season of the year during which they were taken contributed the greatest error in land-use classification of all classes of plots. Because of changes in land use since the date of photography, 1.7 percent of the forest, 11.1 percent of the active agriculture, 39.9 percent of the pasture, and 61.8 percent of the idle agriculture plots were misclassified. Nearly 27 percent of the pasture and 9 percent of the idle agriculture plots were incorrect because the interpreter couldn't distinguish between the agricultural classes on winter and spring photographs.

The error of the adjusted forest area in southwestern Georgia was ±.70 percent, in terms of one standard error, instead of the objective of ±.57 percent. To determine what intensity of ground sampling would be required to obtain the accuracy objective, three separate analyses were made:

1. The forest ground sample was held constant and the number of pasture and idle agricultural plots increased by regular percentage intervals. Doubling these plots reduced the error only ±.02 percent. Further increases would be unwarranted because they had only a small effect on decreasing the error.

2. The nonforest ground sample was held constant and the forest sample increased by regular percentage intervals. It was found that 1,894 more forest ground samples would be necessary before the accuracy objective is reached.

3. The number of forest and nonforest ground samples were adjusted simultaneously to find the smallest number of plots necessary to attain the objective. This resulted in a total of 3,562 plots, an increase of 1,505 forest plots, and a decrease of 45 nonforest plots.

From these three tests it is apparent that to increase the accuracy of the forest area estimate, it would be necessary to increase the number of ground check plots by 1,460, or 69 percent. Limitation of funds for resurvey work would make this increase unlikely. Furthermore, it would be difficult to justify the large increase in field work for such a small gain in accuracy.

Effects of Thinning on Yields of Forest-Grown Longleaf and Loblolly Pines at Urania, La.[1]

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THE QUESTIONS requiring answers in thinning techniques are chiefly concerned with comparison of yields between thinned and unthinned plots as affected by:

1. Severity of thinning.
2. Time and frequency.
3. Products and merchantable sizes used to measure results.
4. Financial comparison of thinned with unthinned plots.

Conditions Affecting the Experiment

Unless pine stands are initially stocked to full capacity, the relative effects of thinning at different ages and of different intensities cannot be fairly determined, nor can comparisons be made between species. It was only by a fortunate set of circumstances that an opportunity was presented on a fenced area near Urania, La. on the property of the Urania Lumber Company to establish a series of ¼-acre plots with isolation strips, for both loblolly and longleaf pines. This area had been cut "clear" in 1904-1905 leaving about ten undersized longleaf pines per acre and "unmerchantable" loblolly pines along the small branches and swales. It was acquired in 1910 for $1 per acre as cutover land.

Until the winter of 1913-14 fires had burned the area annually. In this winter of a heavy longleaf pine seed crop burning was stopped. Longleaf pine seeded the entire area densely. Loblolly pine seeded strips extending to a maximum of about 300 feet from seed sources. On these strips, loblolly pine had completely exterminated longleaf in the seedling and sapling stages. Where stray loblollies were established outside this zone, they acted as wolf trees, each suppressing five to eight longleaf pines in the pole stage. The brown spot problem had not yet been recognized, and because of previous annual fires and hogs there had been no seedling longleaf pines to build up this disease. The first crop after fire exclusion, that of 1913, came through the juvenile 5-year period without disease. In 2 years more, at which time the brown spot struck heavily, enough seedlings had outgrown its zone of defoliation to establish complete cover. This was the stand that offered the opportunity for thinning plots. Unfortunately, the policy of fire exclusion was continued with respect to this stand of saplings, with the result that in 1932-34 nearly four-fifths of the timber was completely killed by four summer fires in 20-year rough. Since then the rough has been burned at about 3-year intervals. The small remaining area was still large enough to establish ten sample plots, which are the basis of this study. The stand is now 38 years old.

Dominance versus Mortality

Since both longleaf and loblolly pines have the capacity to express dominance strongly, the longleaf even more than the loblolly, it was first observed that in these thickets, as long as the dominant saplings retained green crown amounting to 40 percent of total height their diameter growth was not arrested. Stagnation first developed in the smallest and weakest trees, progressing upwards by diameter classes. Mortality thus first took out the 1-inch trees, then the 2-inch, and finally affected the 3-inch trees.

Even in the densest zone of stocking, with no thinning, it has begun to take the 4-inch trees only after about 30 years. Ingrowth of existing 3-inch trees into the 4-inch class has been negligible after the 20th year. Practically all the growth per acre goes to the trees in the upper diameters, with adequate crowns. Thinning for these reasons was postponed despite the completeness and density of the crown cover until the 17th growing season for loblolly was completed, and the trees were 40 feet high. For longleaf the first thinning was made at the end of the 20th growing season, which was 3 years too soon due to the 5-year lag before height growth begins. Delayed thinning does not apply to slash pine and probably not to shortleaf pine, neither of which species express dominance promptly or adequately.

Crown Classes Taken and Left

It had already become evident, from measuring over 500 plots of old-field loblolly pine, that stagnation of diameter growth occurred normally at about the 23rd to 25th year in fully stocked stands, and was coincident in each instance with the reduction of the crown ratio to 30 percent or less. It also appeared that restricted soil moisture and root space were at least as important as light as causes of loss of diameter growth. Hence a practice was adopted of removing in the first thinning about 50 percent of the crown cover or upper story. Codominants were the ones removed, since their crowns were often already too short, and the dominants had good form, were not wolf trees, promised the best growth rate, and were as well pruned in most cases as the codominants. (Where codominants with crown ratios below 30 percent were left in thinning by other agencies at Urania the growth rate was extremely disappointing.)

No trees 3 inches or under at breast height were cut or removed. They were simply ignored, on the basis that they would take practically nothing from the larger trees. This assumption and practice had a very interesting denouement. It was later observed that on the repeatedly thinned plots, all the trees originally 3 inches or less, instead of profiting by greatly increased light and soil space, had died within 10 years. But the simi-

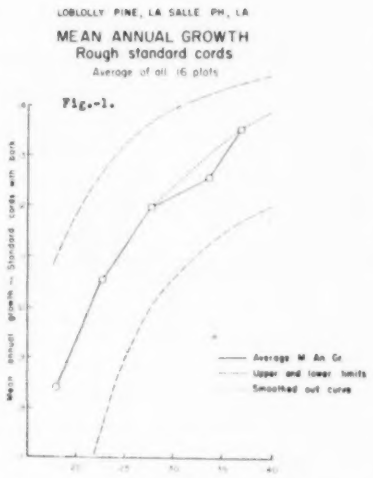
[1]Paper presented at a meeting of the Division of Silviculture, Society of American Foresters, Biloxi, Miss., December 14, 1951.

lar 3-inch trees left on the check plots, where no thinning was done, had not only survived for this period but had put on an average of 10 feet of height growth before beginning to die from crowding. Meanwhile, on these check plots the smaller trees together with the co-dominants had seriously affected the crowns of many of the dominant "crop" trees, reducing their crown-height ratios to less than the required percentage of 40.

Density of Initial Stocking

In applying the rule of taking out 50 percent of the crown canopy, the space left between crowns was obviously about equal to the width of the crown. It was found that the areas on which loblolly pine had been able to suppress and kill the longleaf seedlings and establish itself did not have a similar evenness of stocking to that of the longleaf, which was complete. The density of stocking fell into three zones depending upon distance from seed sources. A zone of heavy seeding occurred within 100 feet of large seed sources. In this zone the dominant trees that had to be left were spaced (at 17 years) about 10 feet apart, or approximately 400 per acre. Within this belt, therefore, spacing of 10 feet was adopted and the trees to be left were selected by using spacing poles 10 feet long, but not attempting geometrical regularity. In the second zone, 100 to 200 feet from the seed source, dispersion of dominants required leaving trees 12 feet apart, or 300 per acre. In the third zone, from 200 to 300 feet away from seed sources, the dominants occurred 15 feet apart, which was the required spacing, leaving 200 crop trees per acre.

A series of loblolly plots was established in each of the three zones. All told, there were eight thinned plots paired with eight check plots. Two pairs were in the 10-foot spacing zone, and three pairs were in 12-foot and 15-foot zones. Establishment took place from 1930-31 to 1932-33, and second thinnings were made for the 10-foot and 12-foot plots at the end of



5 years, at which time it was found that the crowns had completely closed. A third thinning was made in 1940-43 at the end of 10 or 11 years, when the stands were 27 to 29 years old. This was the second thinning for 15-foot plots. One of the 10-foot plots has received a fourth thinning at 35 years of age. All thinned plots will be or have been thinned at 37 and 38 years, after a 10-year period from the third thinning.

Guides to Marking

In these fully stocked stands three indicators were used to determine when a stand should be thinned. The first, especially applicable to young sapling and pole stands, is the aforementioned green crown-total height ratio of 40 percent. The second is the spacing rule of 50 percent, or cleared space equal to crown width. The third, which *for fully stocked stands only* has shown perfect correlation with the other two, is basal area per acre.

For these southern pines, it was discovered from our 500 fully stocked old field plots of loblolly pine (confirmed later for longleaf pine) that 155 square feet of basal area was the saturation point, and that stagnation and shortening of the crowns could be expected when more than 120 square feet was present. Stands may attain 175 square feet, but in a few years will retrograde to 155 feet or less by mortality.

As the result of thinning longleaf too heavily—that is, down to 60 to 65 square feet in which case subsequent growth per acre was reduced — the desirable limit for residual growing stock at 75 to 80 square feet has been set. When a plot reaches or approaches 120 square feet it needs thinning, and this is usually evident on inspection of the crown conditions.

In the ordinary run of forest-grown stands, the basal area per acre seldom reaches 155 square feet, because of blanks and uneven stocking. In these cases, thinning is needed only in the denser clumps, and can best be applied through the first two of these rules, namely, 40 percent crown-height ratio, and space between crowns equal to crown width, rather than basal area per acre. We have never applied a D+ formula, preferring to deal directly with the width and length of the crown as the most reliable and simplest indication of the trees to take and leave.

Frequency of Thinning

In the loblolly plots, the rule for severity of thinning as outlined was closely followed, with full closure of crowns at time of the second and third 5-year thinnings, after which the interval was extended to about 10 years. The product measured for these thinnings was rough pulpwood to a 3-inch top, and 4-inch d.b.h. Yields in board feet were calculated by the International ¼-inch log rule. Peeled cordwood and total cubic volume with bark and peeled, were also computed.

Comparative Yields from Thinned and Check Plots, Loblolly Pine

Summarizing the results in terms of rough cords, we find that at 37 years the over-all average yield is 51 cords, or 1.38 cords mean annual growth at that age. This is on sites averaging slightly over 80 for loblolly pine.

In order to compare the yields of thinned and of unthinned plots, on initial stocking representing (1) overdense or 10-foot spacing of dominants, (2) optimum or 12-

foot spacing, and (3) sparse or 15-foot spacing, mean annual growth for each measurement was computed. These values were plotted over age, and a weighted curve was drawn (Fig. 1). Values from this curve for each year of age were then read and plotted on a straight line. The yield measured for each plot was then compared, for the age of measurement, with the "guiding curve" straight line yield, and the difference plus or minus was plotted (Fig. 2).

These differences, computed separately for thinned and unthinned stands, and for the three degrees of initial density, gave percentage comparisons as shown in Figure 2 for rough cords. It was deemed desirable to smooth out the guiding curve to remove a dip that showed up between the 27th and 37th year by raising its values in these years (Fig. 1), hence the actual plots show greater negative than positive percentages. This does not invalidate the comparisons.

From this simplification it appears that for loblolly pine on Site 80, thinned by the above rules, and avoiding reduction of basal area below 80 feet, the thinnings plus residual stand on thinned plots exceeds the total yield on the check plots as follows:

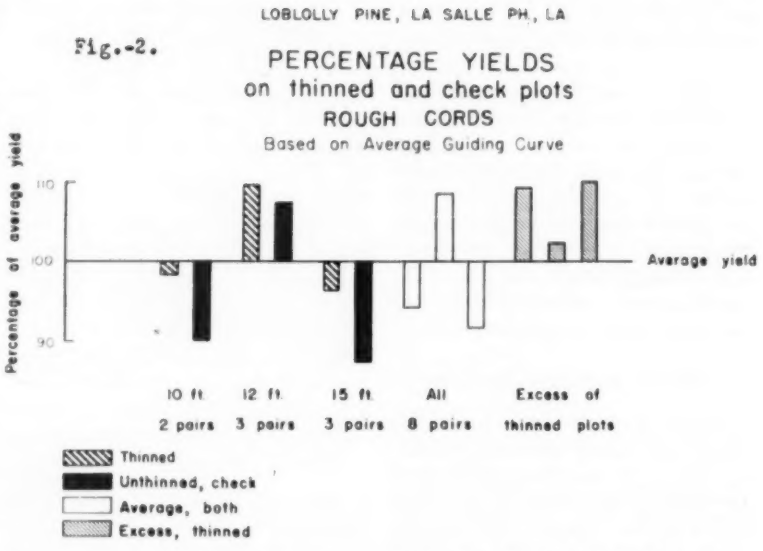
$$12 \text{ ft. } \frac{109.91}{107.52} = 2.2 \text{ percent}$$

$$10 \text{ ft. } \frac{98.46}{90.18} = 9.2 \text{ percent}$$

$$15 \text{ ft. } \frac{96.24}{87.35} = 10.2 \text{ percent}$$

Both thinned and check plots yielded appreciably more cords on optimum 12-foot spacing than with either scant or dense spacing, the consolidated difference being $\frac{108.71}{94.36} = +15.2$ percent as against the 10-foot group and $\frac{108.71}{91.80} = +18.4$ percent compared with the 15-foot sparse group. The first figure indicates the possibility that though both the 12- and 10-foot plots were fully stocked, the release and rapid expansion of the dominants in each group can get better results than in an unthinned stand if the trees are in optimum condition, while if too crowded or stagnant, despite thinning, the yield is reduced. In the case of the sparse stocking, the reason is obvious; the soil has not been fully utilized.

Fig.-2.



To sum up the results expressed in yields of rough cords to 3-inch top outside bark, yields of over 50 cords at 37 years, or about 1.4 cords per acre per year can be obtained on Sites 80 to 85 for loblolly pine, either with or without thinning, provided hardwoods are kept out by use of fire (or otherwise eliminated) previous to initial seeding. Optimum stocking gives dominant trees at 300 per acre after the first thinning, or 12-foot spacing. Thinned plots can be made to equal or exceed check plots in yield of rough cords if proper thinning technique is adopted, to which is added the advantages of early yields, of larger sizes for the residual stand, and definite financial gains from both early returns and higher value for the products.

Effect of Crown-Height Ratios on Diameter Growth

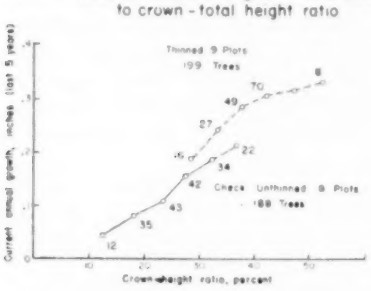
The goal of management should be maximum yields in value of products per acre, converted, at least for private industry, into maximum returns on cost. This goal is not attained by producing the fastest growth on individual trees, regardless of the attractiveness of a display of tree rings an inch in diameter. It consists in producing on an acre the largest volume of desired products in the shortest possible time. To accomplish this the individual tree is the unit that needs attention, just as is the individual cornstalk or wheat plant obtained initially by plant breeding, and to be given maximum conditions for yield per acre by optimum spacing of seed in the ground. The yield of these tree units multiplied by their number per acre gives the total yield.

In thinning a stand, therefore, attention must be concentrated on the culture of the individual tree. Growth in diameter and volume are directly related to volume of functioning crown surface, which depends on height of tree, and length and width of crown. For practical purposes, however, these three dimensions can be reduced to the single ratio, green crown over total tree height.

To measure the relationship of crown-height ratio to diameter growth, the current annual growth was determined for the last 5-year period on 387 trees and plotted over crown-height ratios. Separate curves were constructed for trees on thinned and on check plots.

Observations antedating the first thinnings indicated that the dominant trees in fully stocked or even

Fig. 3. LOBLOLLY PINE, LA SALLE PH., LA
Relation of current growth in D B H to crown - total height ratio



overstocked stands maintained their normal rates of diameter growth as long as they retained a 40 percent crown-height ratio. Consequently, this ratio was set as the goal of thinning, the only question being the severity of crown opening required to maintain the ratio. The results of 20 years' growth on thinned and unthinned plots, as shown by Figure 3 and Table 1 indicate that the practice of removing one-half of a complete crown cover for loblolly (and longleaf) pine has been successful not only in retaining this crown-height ratio but in maintaining the rate of diameter growth which is its corollary. Obviously the best management is that which maintains this crown-height ratio permanently on the largest possible number or proportion of the trees on each acre. This maintains maximum yield and at the same time gives highest quality.

Crowded crowns in unthinned stands have less width and surface for their length than crowns in thinned stands, hence the current annual growth curve for check plots falls below that for the thinned stands (Fig. 3).

Comparison of crown ratios and current diameter growth on thinned check plots are:

	Thinned	Check	Thinned in percent of check
		Percent	
Crown ratio	39.88	25.61	155.5
Current diameter growth o.b., b.h.	.279	.112	249.1

Mortality from suppression begins when the crown-height ratio approaches 10 percent and is complete when that ratio is reached. Current diameter growth up to 40 percent crown ratio shows approximately an increase of .1 inch per year for each 10 percent increase in the ratio, beginning at .1 for a 20 percent ratio.

TABLE 1.—CURRENT ANNUAL GROWTH OF LOBLOLLY PINE AT BREAST HEIGHT OUTSIDE BARK BASED ON CROWN-TOTAL-HEIGHT RATIOS FOR THINNED AND UNTHINNED FULLY STOCKED STANDS AT URANIA, LA.

Crown ratio	Thinned stands		Unthinned stands	
	Diameter growth	Trees	Diameter growth	Trees
Percent	*Inches*	*Number*	*Inches*	*Number*
10	....		.00	
				12
15	....		.055	
				35
20	....		.095	
				43
25	.15		.135	
		16		42
30	.20		.17	
		27		34
35	.26		.20	
		49		22
40	.295		.22	
		70		
45	.31			
		29		
50	.325			
		8		
55	.34			
60	.35			
Total		199		188

TABLE 2.—DIAMETERS ATTAINED BY 100 LARGEST LOBLOLLY PINES PER ACRE AT ABOUT 35 YEARS, AS AFFECTED BY INITIAL STOCKING AND BY THINNING

Initial spacing of dominants	Treatment	Age	D.b.h.	Growth per decade	Superiority of thinned plots
Feet		*Years*	*Inches*	*Inches*	*Inches*
15	Thinned	37	13.5		
		35	13.05		
		34	12.7		
	Average	35⅓	13.2	3.70	0.46
	Check	37	12.8		
		35	11.55		
		35	10.35		
	Average	35⅔	11.55	3.24	....
12	Thinned	37	12.5		
		34	12.1		
		33	11.5		
		34⅔	12.0	3.47	0.45
	Check	37	11.1		
		34	10.55		
		33	9.75		
	Average	34⅔	10.5	3.02	....
10	Thinned	35	10.2		
		33	11.0		
	Average	34	10.6	3.12	0.41
	Check	35	9.9		
		34	8.8		
		34½	9.35	2.71	

It is seen that the 40 percent ratio, giving a steady and continuous average growth of 3 inches per decade, has been maintained on the thinned plots by the removal of 50 percent of the crown cover at about 5-year intervals. The average rate calculated for the check plots, which is but 40 percent of that on the thinned plots, is ac-

companied by rapid deceleration of growth as crowns become progressively shorter, while at about 35 years or sooner, depending on the density of initial stocking, natural mortality starts among trees 4 inches and over.

Effect of Initial Spacing and of Thinning on Diameter Growth of Loblolly Pine

A test was made of the relative growth of the 25 largest trees per quarter acre, or 100 "crop trees" per acre, for the three initial spacings of dominant trees on thinned and check plots. Total growth was found, then average growth per decade, since the last measurements varied from ages 34 to 37 years. Average d.b.h. was derived from average basal area. The results are shown in Table 2.

The differences associated with initial spacing were as follows:

Spacing	Aver. growth per decade	Excess over 10-foot plots	
Feet	*Inches*	*Inches*	*Percent*
15 (Average 6 plots)	3.47	+ .56	+ 19.2
12 (Average 6 plots)	3.245	+ .335	+ 11.5
10 (Average 4 plots)	2.91		

These results show that for the first 3.7 decades there is but ¼-inch increase per decade in diameter for 15-foot or scant spacing on crop trees over 12-foot spacing, but that the gain over dense 10-foot spacing is over ½-inch for 15 feet and ⅓-inch for 12 feet (Fig. 4). Whether for unthinned plots or for thinned plots separately, nearly identical differences obtain despite the smaller growth rate on check plots. For each of the three spacing groups (15, 12, and 10 feet), thinning added nearly the same increment, namely, .46 inches b.h. outside bark per decade, which in a 60-year rotation would increase the ultimate diameter by 2.5 inches if maintained in the future. If a 40 percent ratio of green crown is retained this growth rate should be realized, as shown later. The effect of thinning on growth in d.b.h. for all trees in the stand is shown in Table 3.

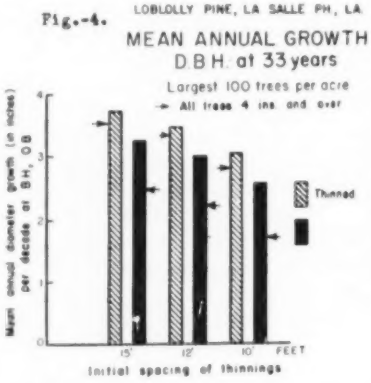
This indicates that the method of thinning by releasing crown space equal to width of crown had added consistently in excess of one inch in diameter growth per decade above the averages on all released trees, i.e., for the residual stand.

The differences in diameter growth per tree caused by degree of initial stocking, in inches per decade, are shown below:

Spacing	Average all plots	Excess over 10 feet	
Feet	*Inches*	*Inches*	*Percent*
15	3.085	+ .805	+ 35.3
12	2.79	+ .510	+ 22.4
10	2.28		

Production in board feet, which is influenced by individual tree sizes, is therefore a question of leaving the number of trees per acre that will fully occupy the soil without undue delay after a thinning, and of making thinnings often enough to retain a green crown ratio of about 40 percent. High quality should be sought not in sacrificing dominants and leaving slower growing codominants. This alternative is forced solely because of initial failure to obtain full stocking, and the resultant production of wolf trees. In fully stocked stands, the dominant trees will prune themselves back to a 40 percent crown ratio when thinnings remove 50 percent of the crown cover, and limbs will remain fairly small.

Fig. 4.



Thinnings in Longleaf Pine

Due to the total destruction by fire of nine-tenths of the pole stands of longleaf pine between the 19th and 21st years, as the result of complete exclusion of protective burning, the accumulation of a highly hazardous rough, and incendiary, uncontrollable fires in late summer, only ten one-quarter-acre plots could be located in the unburned stands, of which five were thinned, four were check plots, and one was cut to a 5½-inch diameter to resemble clear cutting for pulpwood. All stands were fully stocked originally at from ten to twenty thousand seedlings per acre.

An initial thinning was made on one plot at 20 years of age, paired with a check plot. A second pair was established at 21 years and a third at 23 years. Two plots, with a single check plot, were thinned at 25 years of age.

For the thinnings made at 20 and 21 years, a 10-foot spacing of dominants was practiced, leaving 435 trees per acre. The later thinnings at 23 and 25 years were made to a 12-foot spacing, or 300 trees per acre. As with loblolly pine, no trees were cut in the 3-inch and smaller classes. While mortality in these classes continued after thinning, more 3-inch trees reached a 4-inch size than was the case with loblolly pine.

The effect of thinning on this species was noticeably less than for loblolly pine. It was most effective in the 20- and 21-year thinnings, which proved to be premature (15 to 16 years from the initiation of height growth) and resulted in nearly 20 percent reduction of yields in rough cords. The effect of thinning on diameter growth for the 100 largest trees per acre is shown in Table 4, compared with that on the 100 largest loblolly pines.

As will be seen later, the increase in diameter growth of the crop of 100 trees per acre for loblolly pine over longleaf gives the

TABLE 3.—DIAMETER OF LOBLOLLY PINE 4 INCHES AND LARGER, AT ABOUT 35 YEARS AS AFFECTED BY INITIAL STOCKING AND BY THINNING

Initial spacing of dominants	Treatment	Age	Trees 4 inches and greater	Aver. d.b.h.	Growth per decade	Superiority of thinned plots
Feet		*Years*	*Number*	*Inches*	*Inches*	*Inches*
15	Thinned	37	30	11.9		
		35	31	13.25		
		34	23	12.95		
	Average	35⅓	30	12.70	3.59	1.01
	Check	37	63	10.7		
		35	72	8.95		
		35	95	8.0		
	Average	35⅔	77	9.22	2.58	
12	Thinned	37	37	11.7		
		34	29	11.7		
		33	32	11.0		
	Average	34⅔	33	11.47	3.31	1.04
	Check	37	97	8.5		
		34	132	7.65		
		33	123	7.45		
	Average	34⅔	117	7.87	2.27	—
10	Thinned	35	50	8.8		
		33	35	10.3		
	Average	34	43	9.65	2.84	1.12
	Check	35	151	6.3		
		34	150	5.6		
	Average	34½	151	5.95	1.72	

TABLE 4.—COMPARATIVE EFFECT OF THINNING ON DIAMETER GROWTH PER DECADE ON 100 LARGEST TREES OF LONGLEAF AND LOBLOLLY PINES

Age when thinned	Thinned	Plots	Check	Plots	Gain of thinned plots
		Longleaf Pine			
Years	*Inches*	*No.*	*Inches*	*No.*	*Percent*
20	2.79	1	2.35	1	+18.7
21	2.65	1	2.49	1	+ 6.4
23	2.51	1	2.59	1	− 3.1
25	2.68	1	2.43	1	+10.3
Average	2.66	4	2.465	1	+ 8.1
	Loblolly pine, 10- and 12 foot spacing only				
18	3.33	5	2.89	5	+15.2
	Gain loblolly over longleaf, thinned 25.2 percent				
			check 11.8 percent		
			Weighted average 21.4 percent		

former species larger yields per acre, in board feet, but the greater number of longleaf pines that can stand on an acre throws the advantage to longleaf for bulk products.

A comparison of the total basal areas of thinned and check plots, as affected by the age at first thinning, is shown in Figure 6.

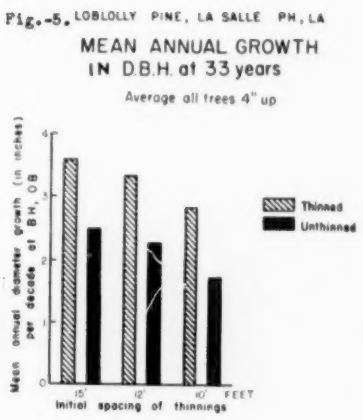
A comparison of yields in rough standard cords on the same basis is shown in Figure 7.

Determination of Site Class as Affected by Thinning

When thinning is made by removal of codominants, leaving the dominant class, the average height of the remaining crowns in the upper crown cover, which is the basis for determining site class, is increased without in any way affecting soil or site Comparison of site with unthinned check plots is thereby invalidated.

For this reason, the average height based on age, for both thinned and check plots, was computed by taking the 25 trees per ¼-acre plot of largest diameter in the tally, and computing the average height of these trees from heights taken from the height curve for the plot. This had the effect of raising the site classes of the check plots over what they would have been as read from the site index graph as usually constructed, bringing them into line and comparable with those of the thinned plots.

Fig.-5. LOBLOLLY PINE, LA SALLE PH, LA



The site index was also computed for each plot before the first thinning, using the same basis of 25 trees per ¼-acre plot, or 100 trees per acre. This gave an initial comparison between the thinned and check plots, in pairs. When a second comparison was made at 33 years between site determined from the 100 largest trees per acre, and from the site index graph in which all the dominant and codominant trees were used, it followed that the number of trees on which the site index graph was based, being reduced from the number at 18 years, coincided more closely with that from the 100 largest trees per acre. Hence the site at 33 years showed less than at 18 years and approached the standard site index chart. By using this modification in determining site quality, the site of thinned stands as found is comparable with that of unthinned plots.

The steps in computing site index from a constant number of trees (in this case 25 per acre), are:

1. Height curve on d. b. h.
2. Stand table by d.b.h. classes.
3. Multiply height by tree numbers in each class beginning with the largest diameters and splitting the smallest class used to obtain the number to complete 25.
4. Divide by 25 for average height.
5. Read the height at this age from a selected curve in index chart most closely corresponding to this average height obtained.
6. Divide the average height by this height to obtain percentage deviation.
7. Apply this percentage to the site figure of the curve used to obtain site index for the plot.

Deviation of the site index from the standard curve, as stated, con-

Fig.-6. LONGLEAF PINE, LA SALLE PH, LA

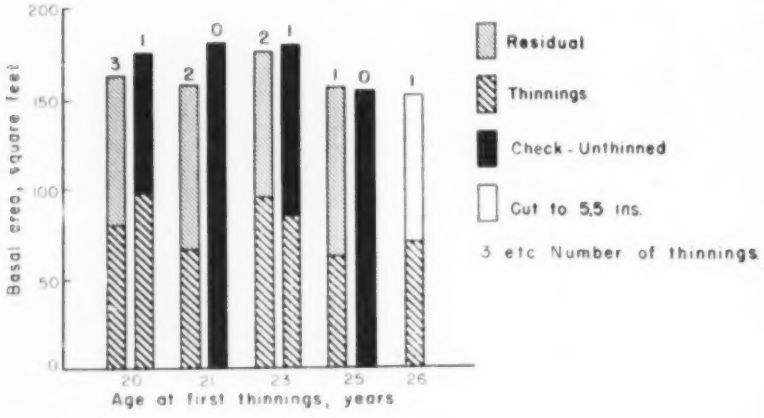
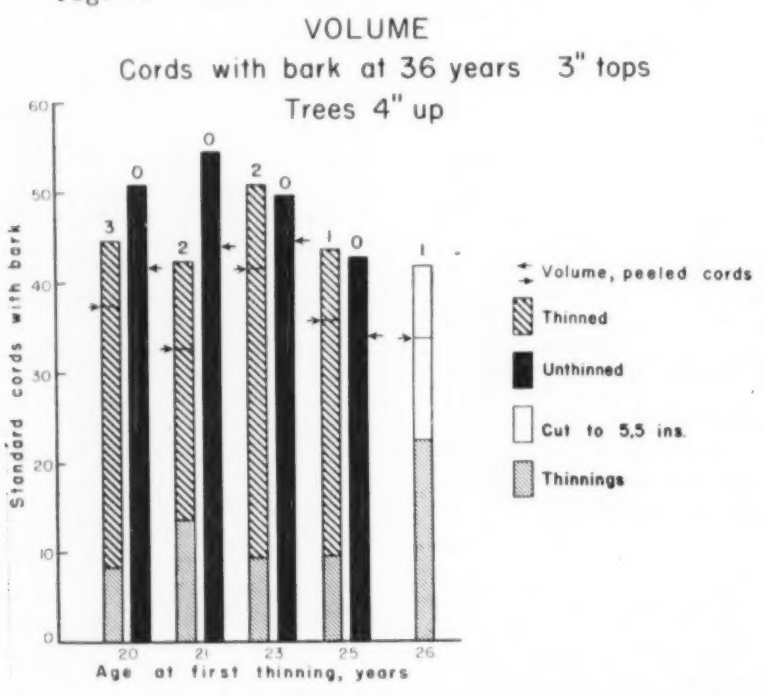


Fig.-7. LONGLEAF PINE, LA SALLE PH, LA



tained the diversion due to selecting a consistent number of the largest or "crop" trees for heights. The amount of this influence can be determined by computing in turn the site index by the usual methods of averaging the heights of all dominant and codominant trees, or, from the tally, by deciding from the height curve (and growth) what diameter classes should be included in the dominant plus codominant numbers.

The comparisons of site index for five pairs of plots of loblolly pine at 18 and 33 years, on the 100 trees per acre basis showed:

	18 years	33 years	Drop
Thinned	90.31	85.47	—5.78
Check	84.77	80.00	—4.77
Difference	—5.54	—5.47	

In the remaining 17 years before the standard age of 50 years is reached there should be an additional drop, but not as great since the diminution of tree numbers will be much less in this period than previously.

The average site index of all eight pairs of plots displayed practically the same drop for thinned as for check plots, indicating that thinning after the 18th year, with heights averaging over 40 feet, had not affected relative height growth beyond this point. But previous to thinning and below 18 years and 40 feet in height, the original density of stocking had a marked effect on height growth and hence on site index. This is brought out in Table 5.

Comparative Yields of Longleaf and Loblolly Pines, When Grown on Similar Site Quality

Comparative yields were determined for the age of 36 years, for longleaf and loblolly pines. For valid comparisons, differences in site quality should be negligible. The site index graphs and volume tables used here are those appearing in Miscellaneous Publication No. 50.[2] According to the site index graph, longleaf and loblolly attain an identical height of 67 feet at 36 years on Site 80. This indicates that longleaf pine during this initial period makes up its 5-year lag in starting height growth.

The site quality of each plot was computed at 36 years by the method described of utilizing the 100 tallest trees per acre. The average site was found to be

Loblolly pine	82.7
Longleaf pine	78.1

The difference of 4.6 feet in favor of loblolly pine is a reflection of the location of this species on lower elevations because of seed tree location near streams.

Comparative yields per acre at 36 years in rough cords, including the volume of all thinnings, for 8 longleaf and 16 loblolly plots in pairs, were as shown in Table 6.

[2]Volume, yield, and stand tables for second growth southern pines. U. S. Dept. Agric. Misc. Publ. 50. Sept. 1929.

TABLE 5.—LOBLOLLY PINE. CHANGE IN AVERAGE SITE INDEX IN 15 YEARS DUE TO USING FIXED NUMBER OF TREES AS BASIS, AS DETERMINED FROM STANDARD SITE INDEX CURVE

Initial spacing of dominants	Treatment	Average site index, feet		Gain over 10 foot spacing	
		18 yrs.	33 yrs.	18 yrs.	33 yrs.
Feet				*Percent*	
10	Thinned	82.8	80.3		
	Check	80.8	76.9		
	Average	81.8	78.6		
12	Thinned	90.7	85.7		
	Check	89.6	80.8		
	Average	90.2	83.2		
	Gain over 10′	8.4	4.6	+11.0	+5.9
15	Thinned	94.9	88.7		
	Check	82.6	81.2		
	Average	88.8	85.0		
	Gain over 10′	7.0	6.4	+ 8.6	+8.1

TABLE 6.—COMPARATIVE YIELDS IN ROUGH CORDS, FOR LONGLEAF AND LOBLOLLY PINE, ON THINNED AND CHECK PLOTS, URANIA, LA. AT 36 YEARS OF AGE

	Longleaf		Loblolly	
	Total yield	Mean annual growth	Total yield	Mean annual growth
Thinned	45.29	1.26	48.10	1.34
Check	49.79	1.38	46.13	1.28
Average	47.54	1.32	47.11	1.31
Difference of thinned from check	−4.50	−.12	+1.97	+.06

The result is of primary significance to southern forestry. Longleaf pine has produced at 36 years slightly more rough pulpwood than loblolly pine. Actually, it did this under two additional handicaps. As noted, its site index was 4.6 feet lower than that of loblolly. For 36 years the difference in yield of rough cords (Table 78, U. S. Misc. Publ. 50)[2] to be expected of longleaf pine growing on Site 82.7 (average of the loblolly plots) instead of 78.1 is +10.1 percent. This would give 52.3 cords. Actual yields on Site 80 for two check plots were 54.5 and 52.2 cords, as against 46.1 cords for loblolly check plots on similar site. The second handicap is attributable to thinning at too early an age. Ages of 20 and 21 years are 15 and 16 years from initiation of height growth, and the thinning was too heavy, leaving from 50 to 60 square feet of basal area. When the first thinning was postponed from the 20th and 21st years to the 23rd and 25th years, this reduction in total yield disappeared. The loss from premature and too heavy thinnings was 26 percent compared with check plot yields, and pulled down the average yield of thinned plots by 4.5 percent of the check plot figures. There was no comparable loss from loblolly thinnings; in fact, the total yield with thinnings, on the thinned plots for this species exceeded that on the check plots by 2 cords.

When the 10 percent reduction in yield based on difference in site, and the 5 percent lost by premature heavy thinning are considered, it is indicated that longleaf pine on sites identical to loblolly pine has the capacity to yield 15 percent more than loblolly in rough cords at 36 years from seed, despite an average 5-year lag in initiating height growth.

The crowns of loblolly extend laterally to greater widths for the same d.b.h. than do the longleaf crowns, and close gaps more rapidly. It therefore follows that if longleaf pine is thinned by removing half the crown cover, which was the plan pursued except for the too heavy early thinnings, more trees will be left per acre than with loblolly pine. This excess of tree numbers makes up for the slower diameter growth. As the yields and thrift of loblolly pine rapidly diminish on poorer sites on which longleaf still is vigorous, the difference in yields in favor of longleaf on its natural sites as against invading loblolly pine must necessarily be still greater.

Good fortune, alone, in the history of this experimental area, permitted these valid comparisons to be made.

TABLE 7.—MEAN ANNUAL GROWTH, IN BOARD FEET, FOR LONGLEAF AND LOBLOLLY PINE ON THINNED AND CHECK PLOTS

	Longleaf pine			Loblolly pine		
	Thinned	Check	All plots (16)	Thinned	Check	All plots (8)
Mean annual growth	329.5	343.5	336.5	432.6	407.5	420.1
Excess over longleaf (percent)				+31.3	+18.6	+24.8
Excess of thinned over check (percent)	−4.1			+ 6.0		

Fig.-8. LOBLOLLY PINE, LA SALLE PH., LA.

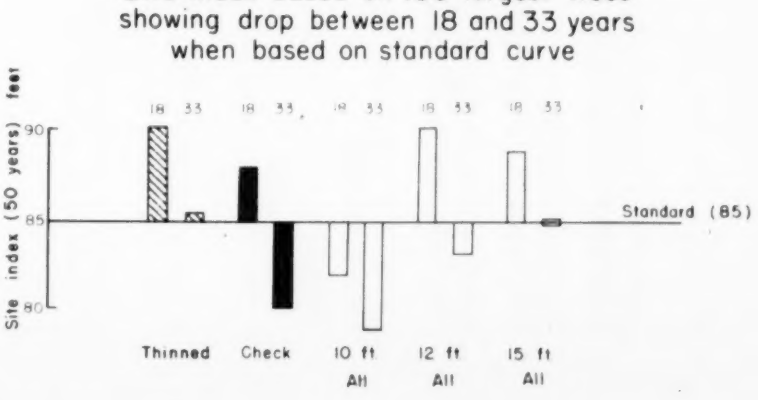


Fig.-9. COMPARATIVE YIELDS
Longleaf and Loblolly pine at 36 years

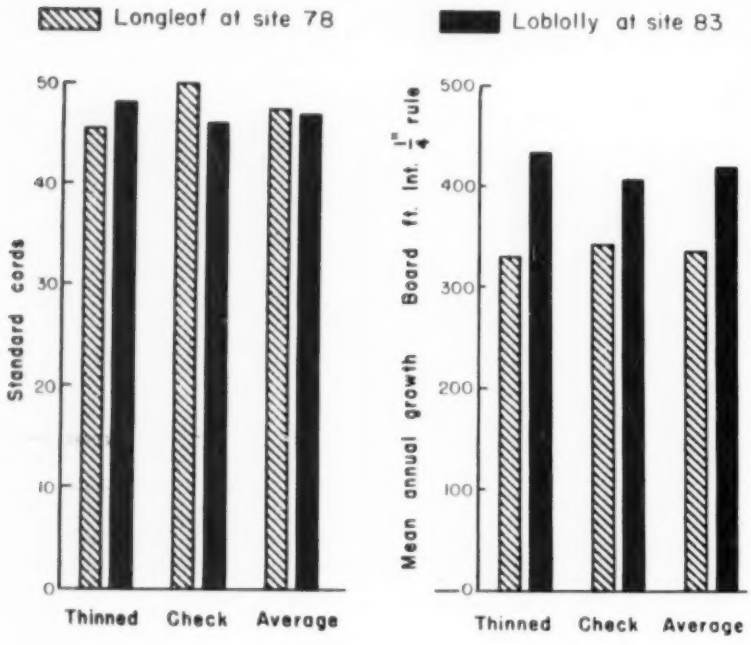
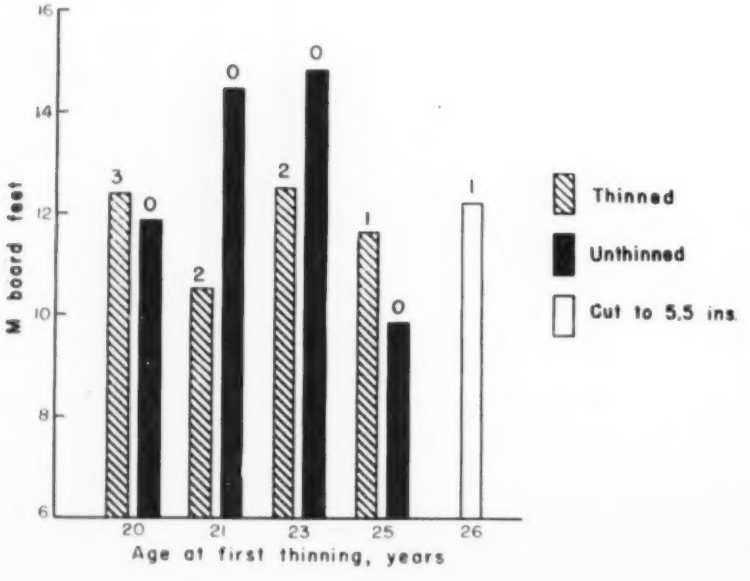


Fig.-10. LONGLEAF PINE, LA SALLE PH., LA.
VOLUME
Bd. Ft. at 36 years Int. ¼" rule, 6" top.
3 etc. Number of thinnings



The comparison in board-foot yields, including thinnings, when based on the International ¼-inch rule, and utilization to include the 6-inch diameter class and larger is based on the mean annual growth of the two species at 36 years (Table 7).

Thus when reduced to an acre basis, the larger diameters attained by loblolly pine produce greater relative yields of saw timber than the more numerous longleaf pines and the advantage shown in growing bulk wood is lost. The increasing board foot-cubic foot ratio is largely responsible for this result. See Figure 9.

In Figure 10 is shown the comparative yields in board feet, longleaf pine, for thinned and check plots, as affected by the age of the stand at the first thinning.

Comparative Total Production of Peeled Wood

Production of wood fiber is the soundest basis of comparison of productiveness both for species and sites, although this standard is extensively modified by the economic requirements for size and quality. In comparing longleaf and loblolly pines, trees in and below the 3-inch classes were omitted. In even-aged fully stocked stands that have reached 30 years and over, the remaining trees in these classes are practically all doomed to die before reaching 4 inches, whether or not thinnings are then made.

Comparison of the two species, for the average age of 36 years, was based on mean annual growth of peeled wood in cubic feet. (Table 8.)

This comparison indicates that the slight excess in total yield of wood fiber of loblolly over longleaf pine is probably fully accounted for by the better site quality of the former species. (Figure 11.)

For longleaf pine only, the effect of premature heavy thinnings on volume of peeled wood is shown in Figure 12.

Financial Possibilities

This project at Urania, La. has demonstrated what can be done in producing wood from longleaf as

well as loblolly pine, provided the measures are taken, at the time of initial seeding, to obtain complete stocking of pine and practical elimination of hardwoods in the crop. Longleaf is so much better adapted to drier soils than is loblolly that it was pure chance that the site was available, approximately 80 for both species, on which valid comparison could be made. The silvicultural demands of the two species with respect to fire are so different in the stage of reproduction that complete stocking of longleaf cannot be secured without exterminating loblolly seedlings by burning, while if *after* the initial seeding of loblolly, fires are kept out for the requisite 8 to 10 years, longleaf in the mixture will in turn be eliminated by shade. The two species then must always be grown separately, the longleaf pure, the loblolly as pure as can be attained against persistent hardwoods. The choice of site for each species is easily made. Wherever longleaf originally stood—which was practically always in pure stands—there longleaf can again be grown in pure stands. On these longleaf areas this species will not merely equal loblolly in total wood fiber production on comparable sites, but as the site becomes poorer and more typical of longleaf as a whole, loblolly does relatively much less and the balance is thrown altogether towards longleaf. This means that on the whole, the extensive invasion of longleaf lands by loblolly pine along the northern portion of its zone marks a definite loss of cubic volume production from these sites. This is true despite the more rapid growth in diameter of individual loblolly pines. But on all sites originally occupied by loblolly pine and hardwoods, this species and not longleaf should prove most profitable.

Bearing these factors in mind, it is possible from the yields at Urania to show tentatively the financial returns that can be realized from intensive silviculture for these two species, and on a valid basis of comparison.

The area originally bearing pure longleaf pine forests, in the 5 states of Alabama, Florida, Louisiana, Mississippi, and Texas is approximately 23 million acres. Adding Georgia, North and South Carolina would bring this total roughly to 30 million acres. The yield of longleaf on Site 80 under intensive, sound management is 50 cords per acre at 36 years. Adopting 36 cords, or 1 cord per acre for the average longleaf site (rough wood), at $5 per cord stumpage value, the gross returns per acre on longleaf

Fig.-11. COMPARATIVE YIELDS

Total cubic feet of peeled wood at 36 years

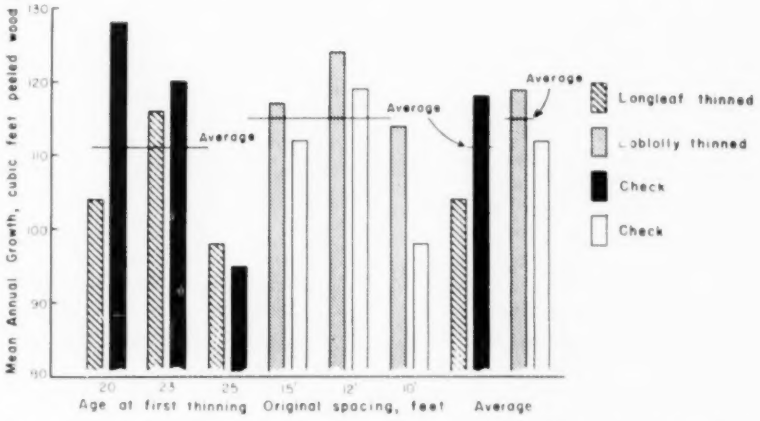


TABLE 8.—COMPARISON OF LONGLEAF AND LOBLOLLY PINE BASED ON MEAN ANNUAL GROWTH OF PEELED WOOD

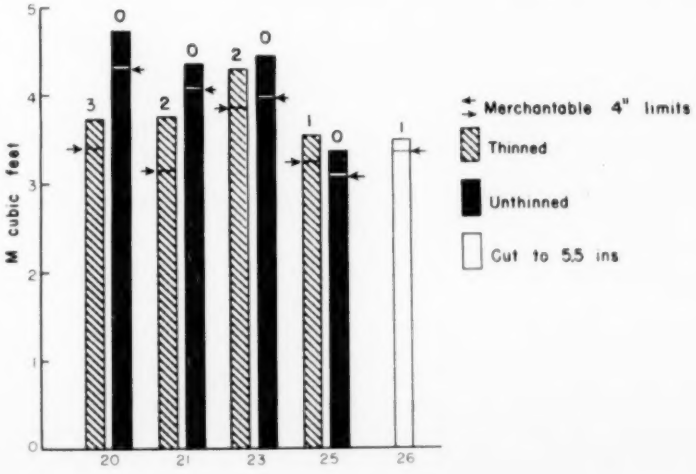
Plots	Longleaf 10	Loblolly 16
Average age at last measurement, years	36.1	34.9
Average site at 50 years, feet	78.1	82.7
Mean annual growth, cubic feet	109.2	115.4
Loblolly site in percentage of longleaf site		105.9
Loblolly yield in percentage of longleaf yield		105.7

Fig.-12. LONGLEAF PINE, LA SALLE PH, LA

VOLUME

Total cubic feet peeled at 36 years

3 etc. Number of thinnings



at this age would be $180 for pulpwood as the sole crop, or $5 per acre per year, giving a total gross annual income on 30 million acres of $150,000,000, or a total for 36 years of $5,400,000,000. Due to former complete ignorance of the methods required for securing longleaf pine reproduction, only a fraction of these potential yields has actually been realized in second growth longleaf pine, and where by sheer accident a promising second crop has become established, it has frequently been stripped by clear cutting for pulpwood, thus completing the elimination of the species. The loss is not total, due to substitution of slash pine in the southern, and loblolly in the northern portions of longleaf range. The inferiority of loblolly on longleaf land is a demonstrated fact, while slash pine is subject to infection of fusiform rust on longleaf and scrub oak lands. While on much flat land especially in Georgia, slash pine appears to be a more profitable species than longleaf, this is seriously questioned for dry longleaf sites. Longleaf is seldom affected by fusiform rust.

A further great loss has already been incurred on natural loblolly pine sites by permiting the invasion of hardwoods of poor quality by the mistaken practice of total exclusion of fire as a silvicultural agent. This hardwood invasion is taking place extensively on areas of second-growth loblolly pine which owe their present stocking largely to fires that occurred in connection with the original establishment of these stands. Perpetuation of full stocking of this pine in the future will require as complete an elimination of low-grade hardwoods as occurred by pure accident at Urania previous to regeneration of the stands from which these yields were obtained. Without these measures, the yield of this pine will steadily diminish in future crops until the profit margin may entirely disappear.

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Sampling Error in the Estimation of Site Index

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IT IS COMMON PRACTICE for foresters to estimate the average site index of an area by taking measurements from a few trees or, in some cases, from only one tree. Too often the fact that such estimates are subject to sampling error is ignored. In the practical application of yield tables it is important that site index be estimated with considerable accuracy if relatively large errors in the determination of growth and volume are to be avoided. When the average site indices of two areas are to be compared it is important to recognize that both indices are subject to sampling error and that the difference between areas might, in some cases, be more apparent than real.

This point may warrant further comment. In estimating site the forester ordinarily picks that dominant or codominant tree or small set of two or three trees which, in his opinion, best expresses the capability of the area in question to grow trees. This tree or set of trees may be considered a sample from an infinitely large hypothetical universe of similar trees on an area. Since there is variation among trees of the same area with respect to site index, a sample could only give an imperfect estimate of the true but always unknown average site index. The purpose of this article is to show that the sampling error of an estimated average site index may be quite large, especially when the number of site determinations used to determine the average is small.

Site determinations were taken from six trees on each of 24 1/5-acre circular plots in connection with a soils study conducted by the Pacific Northwest Forest and Range Experiment Station in south-

TABLE 1.—SITE INDICES[1] BY PLOT

1/5 acre plot	Tree number: 1	2	3	4	5	6	Average	Range
	Site index							
1	147	158	158	170	170	154	160	23
2	198	174	196	180	194	177	186	24
3	198	199	176	205	180	190	191	29
4	191	187	197	170	177	193	186	27
5	181	180	195	177	174	181	181	21
6	151	144	146	152	129	142	144	23
7	188	169	186	153	170	169	172	35
8	195	199	205	184	203	190	196	21
9	180	187	180	198	183	180	185	18
10	227	220	213	213	225	232	222	19
11	174	179	199	171	170	178	178	29
12	191	192	177	168	168	185	180	24
13	186	186	190	185	173	183	184	17
14	166	179	201	141	161	159	168	60
15	155	148	159	159	160	157	156	12
16	150	163	176	157	163	162	162	26
17	146	129	118	129	140	136	133	28
18	214	203	198	211	196	206	205	18
19	207	219	212	197	180	190	201	39
20	194	199	205	187	199	195	196	18
21	192	186	186	188	188	212	192	26
22	192	198	184	191	167	180	185	31
23	155	173	168	175	173	159	167	20
24	177	154	174	178	165	182	172	28

[1]McArdle, R. E. and W. H. Meyer. The yield of Douglas fir in the Pacific Northwest. U. S. Dept. Agric. Bul. 201. 1930. (Rev. 1949.)

TABLE 2.—SAMPLING ERRORS FOR SAMPLES OF DIFFERENT SIZES

Number of site determinations per area	Standard error	Sampling error at the 95 percent level of fiducial probability
	Site index units	*Site index units*
8	±3.58	± 8.74
7	±3.83	± 9.37
6	±4.14	±10.64
5	±4.53	±12.58
4	±5.06	±16.10
3	±5.85	±25.17

western Washington. All plots were in even-aged stands of Douglas-fir. The ages of these stands and therefore of the measured trees ranged from 25 to 95 years. All site measurements were taken with considerable care.

Table 1 shows how the site indices varied within the plots. This variation probably results from several causes, chief among which may be differences in the genetic constitution of trees, errors of technique in determining heights and ages of trees, differences in the degree of dominance in trees selected for the site determinations, and local variation in site within the area for which an average index is being estimated.

The average of 24 estimates of within-plot standard deviaton from the 24 plots was calculated to be 10.13. This is a numerical expression of the average variation among site indices within plots. It was used in this formula for calculating standard error:

$$s_x = \sqrt{s^2/n}$$

where s_x = The standard error of an estimated average site index for a particular area.

s = Standard deviation—an index of the variation among determinations of site index on the area.

n = The number of trees in the sample which led to the estimated average site index.

Different values for "n" were used in this formula to calculate the sampling errors listed in Table 2. So far as the data in Table 1 are concerned there is no correlation between the amount of variation among site indices within plots and the size of the average site index.

The sampling errors listed in Column 3 of Table 2 are the standard errors of Column 2 multiplied by Student's "t" for the appropriate degrees of freedom. They represent limits around the estimated average site index within which the true site index may be expected unless a 1-in-20 chance has occurred in sampling.

Apparently when an estimated average site index is based on a sample of only a few trees, the corresponding true site index could be considerably different. It is important, therefore, when a precise evaluation of site is required, to give consideration to the size of the sample used to provide the estimated average site index. If an estimated average index used for entering the Douglas-fir yield table is in error by only 10 site index units, the indicated volume could be in error by as much as 17,000 board feet per acre. The information in Table 2 suggests that sampling errors of 10 site index units might be quite common.

It is probable that the sampling errors appropriate for other projects involving larger areas, less homogeneous conditions, and perhaps less precise measurements would be at least as large as those listed in Table 2.

Forest Research Advisory Committee Meets

The Forest Research Advisory Committee, which met in Washington, D. C., December 1-3 to study the forest research program of the U. S. Department of Agriculture, recommended intensified research in seven broad fields: (1) forest fires, (2) forest insects and diseases, (3) watershed management, (4) forest economics, (5) forest utilization, (6) forest management, and (7) range management.

Recommendations included development of a more effective fire hazard rating system, replacement with forage of weeds and brush now reducing the productivity of nearly 250 million acres of our western rangeland, increased research on the role of forests and ranges in flood and sediment control and water yield, and establishment of additional hydrologic laboratories by the Department of Agriculture.

Set up under the Research and Marketing Act of 1946 to study the department's forest research program, the committee reviews and advises on research in progress, and recommends new projects.

Committee members present at the meeting were: Clay Stackhouse, Wakeman, Ohio, farmer and woodland owner; Thurman E. Berceaw, Bogalusa, La., Gaylord Container Corporation; Harley Langdale, Jr., Valdosta, Ga., Langdale Company; Sam M. Nickey, Jr., Memphis, Tenn., Nickey Brothers; C. C. Heritage, Tacoma, Wash., Weyerhaeuser Timber Company; Gus P. Backman, Salt Lake City, Utah, Chamber of Commerce; Carl V. Youngquist, Columbus, Ohio, Ohio Department of Natural Resources; Seth Gordon, Sacramento, Calif., California Department of Natural Resources; and Russell Lord, Bel Air, Md., editor, *The Land*.

Dr. Carleton P. Barnes of the Agricultural Research Administration is executive secretary of the Forest Research Advisory Committee.

Effects of Trampling Disturbance on Watershed Condition, Runoff, and Erosion

Paul E. Packer

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THE DISTURBANCE OF LITTER and soil caused by livestock trampling has long been known to be an important factor contributing to accelerated erosion and summer storm runoff on western forest and range lands. Effective watershed management of those lands, however, continues to be handicapped by a lack of useful information about the tolerable limits of trampling disturbance.

This report describes a trampling disturbance study that was made in 1951 on a portion of the Boise River Watershed in Idaho where steep slopes, overgrazing, and a naturally unstable granitic soil have combined to create a difficult erosion control problem (*5*). In this study attention was focused on two intermixed types of foothill spring-fall range. These included areas dominated by the native perennial bluebunch wheatgrass (*Agropyron inerme*) and by the exotic annual cheatgrass brome (*Bromus tectorum*).

It was ascertained from a previous infiltrometer study (*3*) that two specific ground cover conditions are necessary for minimizing overland flow and soil erosion on undisturbed wheatgrass and cheatgrass range during rainfall typical of that expected in occasional major summer storms. These two conditions were first, that no more than 30 percent of the soil surface be bare, the remainder—70 percent or more—being covered by either plant foliage or litter; and second, that the bare soil openings between the plants and litter patches be no larger than 4 inches in diameter on wheatgrass range and no larger than 2 inches in diameter on cheatgrass range.

These ground cover conditions were generally found on sites having an aerial plant density of 35 to 45 percent when projected vertically on the ground surface. On undisturbed wheatgrass and cheatgrass range having the above ground cover conditions, rainfall runoff during test applications of water comparable to those of major storms did not exceed 7.3 and 3.3 percent, respectively. The respective soil losses did not exceed 460 and 260 pounds per acre. Increasingly greater amounts of runoff and erosion occurred on sites having lesser amounts of ground cover and larger bare soil openings.

A follow-up infiltrometer study (*4*) indicated the above ground cover conditions are probably inadequate for watershed protection purposes if the two range types are subjected to intensive trampling disturbance. The present study was therefore designed to determine what levels of trampling disturbance the two range types could withstand without stepping up storm flow and erosion beyond the safe limits for undisturbed range.

Plan of Study

A 6- by 2-foot plot was established on each of 75 wheatgrass and 75 cheatgrass sites. Within each of these two cover types the plots were located so that 25 occurred in each of three ground cover classes —70 to 75 percent, 80 to 85 percent, and 90 to 95 percent. Thus, all plots had at least the minimum amounts of ground cover required for protection on undisturbed range.

Each of five degrees of mechanical trampling was randomly applied to five of the 25 plots in each ground cover class. These treatments included disturbances of 0, 10, 20, 40, and 60 percent of the plot surface. Trampling was done by means of a steel "hoof." This device consisted of a weighted bar on the end of which was welded a circular piece of steel 0.2 square foot in area. The degree of trampling was controlled by varying the spacing and number of impacts of the "hoof" from plot to plot. Disturbances of 10, 20, 40, and 60 percent closely simulated the soil disturbance caused by light, moderate, moderately heavy, and heavy grazing use by livestock.

Ground cover and bare soil opening measurements were obtained on the plots before and after trampling. Ground cover over the entire plot was estimated by the square-foot-density method (*6*). A bare soil index was obtained by measuring in inches the length of the largest bare soil opening along the lower boundary of each plot.

Following the trampling treatments, a modified type F infiltrometer was used to apply an artificial rainstorm of approximately 3.8 inches per hour for 30 minutes on each plot. Total amounts of overland flow and soil erosion were measured. These amounts, as well as the values of ground cover and bare openings on the plots, were then subjected to analyses of covariance to determine to what extent they had been affected by the different trampling treatments.

Effects on Ground Cover Conditions

All levels of trampling disturbance reduced the amount of ground cover and increased the size of bare soil openings on both range types. The amount of the reduction in ground cover and of the increase in the size of bare soil openings consistently increased with amount of trampling disturbance up to a level of 40 percent disturbance. Sixty percent disturbance caused about the same reduction in ground cover and about the same increase in the size of bare soil openings as 40 percent disturbance. On most of the plots that received 60 percent disturbance it was observed that some of the "hoof" impacts occurred in litter that had been moved by previous impacts, resulting in a redistribution of litter around the plot without any further appreciable reduction in the amount of ground surface covered or increase in the size of

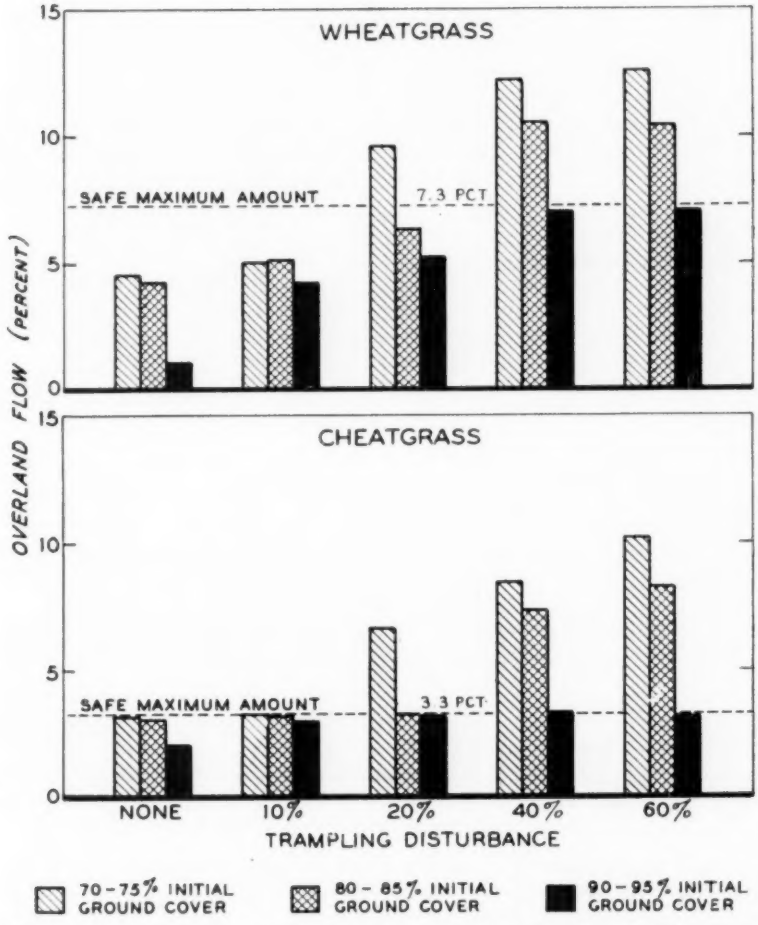

FIG. 1.—Overland flow as affected by various degrees of trampling disturbance on wheatgrass and cheatgrass range having three different initial amounts of ground cover in relation to previously established safe maximum amounts of storm runoff.

bare soil openings. This action was most noticeable on plots with higher initial amounts of ground cover and may account for the similarity of trampled ground cover conditions on 40 and 60 percent disturbed sites.

On both types of range having an initial ground cover of 90 to 95 percent, none of the trampling treatments were effective in altering ground cover conditions beyond the limits previously found to be necessary for minimizing runoff and erosion on undisturbed range. That is, none of the trampling treatments reduced the ground cover to less than 70 percent, nor did they increase the size of bare soil openings to more than 4 inches on wheatgrass areas or to more than 2 inches on cheatgrass areas. On sites having a ground cover of 80 to 85 percent, trampling disturbance up to 20 percent did not cause changes in ground cover conditions beyond these protective limits, but 40 and 60 percent disturbances did. On sites of 70 to 75 percent initial ground cover, all but the 10 percent trampling treatment reduced ground cover significantly below 70 percent and also increased the size of bare soil openings beyond the maximums that provide protection.

Effects on Overland Flow

All levels of trampling disturbance increased the amount of overland flow above that on undisturbed sites on both range types (Fig. 1). The amount of increase in overland flow was highly significant on all wheatgrass sites except in the cases of 10 percent trampling on sites of 70 to 75 and 80 to 85 percent ground cover. Highly significant increases also occurred on the cheatgrass type except in the following instances: on all sites where there was only 10 percent trampling disturbance; on sites of 80 percent or more ground cover, where there was 20 percent trampling; and on sites of 90 percent or more ground cover where there was 40 and 60 percent trampling. Sixty percent disturbance did not cause significantly greater increases of overland flow than 40 percent disturbance, except on cheatgrass sites having an initial ground cover of less than 75 percent.

On both types of range having an initial ground cover of 90 to 95 percent, none of the trampling treatments increased overland flow significantly above the maximum amounts to be expected from effectively protected undisturbed range; that is, 7.3 percent from wheatgrass sites and 3.3 percent from cheatgrass sites. On sites having a ground cover of 80 to 85 percent, trampling disturbance up to 20 percent did not cause overland flow to exceed these levels, but 40 and 60 percent disturbances created significant increases beyond the protective limits. On sites of 70 to 75 percent initial ground cover, all but the 10 percent trampling treatment increased overland flow significantly beyond the protective limits.

Effects on Soil Erosion

All the trampling treatments increased the amount of soil erosion above that on undisturbed sites on both range types (Fig. 2). The amount of increase was highly significant except in the cases of 10 percent trampling on sites of 70 to 75 and 80 to 85 percent ground cover in both range types and of 20 percent trampling on cheatgrass sites of 80 to 85 percent ground cover. There were no significant differences, however, in the amounts of increase in soil erosion resulting

from 40 and 60 percent disturbances on either range type.

On both types of range having an initial ground cover of 90 to 95 percent, none of the trampling treatments increased soil erosion significantly above the maximum amounts to be expected from effectively protected undisturbed range; that is, 460 pounds per acre from wheatgrass sites and 260 pounds per acre from cheatgrass sites. On sites having a ground cover of 80 to 85 percent, soil erosion did not exceed these levels under trampling disturbance up to 20 percent but there were significant increases under 40 and 60 percent disturbances. On sites of 70 to 75 percent initial ground cover, soil losses exceeded the protective level by significant amounts under all but the 10 percent trampling treatment.

Protection Requirements for Disturbed Range

Where trampling disturbance did not create ground cover and bare opening conditions exceeding the range of conditions necessary for effective protection on undisturbed sites, the resulting amounts of overland flow and soil erosion were not significantly in excess of the maximum amounts to be expected from comparable undisturbed sites. It appears reasonable to conclude, therefore, that effective control of summer storm flow and soil erosion on trampled wheatgrass and cheatgrass range requires ground cover and bare opening conditions which, after alteration by trampling, are not significantly different from the ground cover and bare opening conditions needed for protection of undisturbed range. The initial ground cover and bare opening conditions required for protecting wheatgrass and cheatgrass range subject to different levels of trampling disturbance are shown in Table 1.

The results of this study emphasize the importance of maintaining litter cover on the ground. In this respect they correspond with previous results on the same range types (*3, 4*). They also confirm the results of an earlier study (*1*) concerning the effects of soil disturbance in increasing summer storm flow and erosion losses from these range watershed lands. It is recognized that the study has some limitations including the use of artificial rainfall, small plots, and artificial trampling. Notwithstanding these limitations, the infiltrometer approach used in this study does furnish information on the storm flow and erosion behavior of local sites under the impact of rainfall reasonably comparable to that expected in a major storm and provides a basis for developing useful criteria of the protection requirements for the tested lands. Cropping of the aerial plant cover by grazing no doubt tends further to

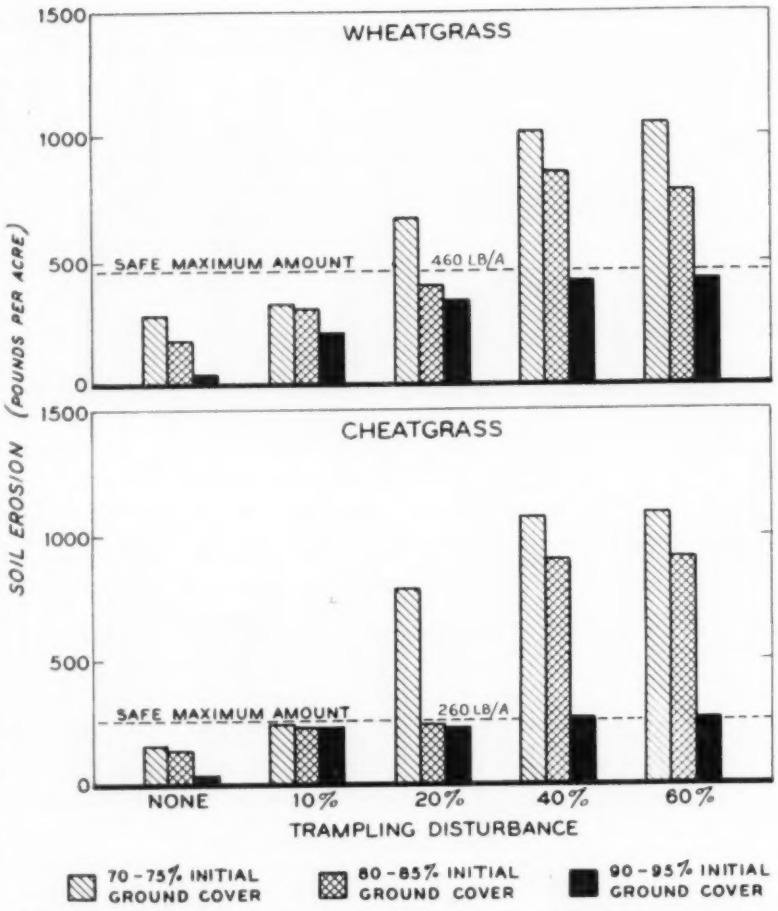

FIG. 2.—Soil erosion as affected by various degrees of trampling disturbance on wheatgrass and cheatgrass range having three different initial amounts of ground cover in relation to previously established safe maximum amounts of soil loss.

TABLE 1.—INITIAL AMOUNTS OF GROUND COVER AND SIZES OF BARE OPENINGS REQUIRED FOR PROTECTING WHEATGRASS AND CHEATGRASS RANGE WATERSHEDS SUBJECT TO DIFFERENT LEVELS OF TRAMPLING DISTURBANCE

Trampling disturbance	Wheatgrass		Cheatgrass	
	Minimum ground cover	Maximum bare soil opening	Minimum ground cover	Maximum bare soil opening
Percent	*Percent*	*Inches*	*Percent*	*Inches*
0	70	4.0	70	2.0
10	70	2.5	70	1.6
20	80	1.6	80	1.3
40	90	1.0	90	1.2
60	90	1.0	90	1.2

reduce the amount of herbage that would eventually become ground cover in the form of litter. This suggests that the findings of this study regarding protection requirements are probably somewhat conservative since no actual grazing of herbage was involved.

The findings of this study have some important management implications for the granitic soil—wheatgrass and cheatgrass range lands of southwestern Idaho. It appears that such ranges having less than 70 percent ground cover are probably not in a satisfactory watershed condition and should be improved. It also appears that where these ranges have from 70 to 80 percent ground cover, light grazing use is indicated for maintenance of protective conditions. On range having ground cover on the order of 90 percent or more, trampling alone is apparently not too serious a consideration. Maintenance of such high amounts of ground cover, however, is problematical under actual grazing use that causes repeated heavy disturbance and also removes a considerable portion of the litter potential in the form of forage. Further tests are needed to check the findings of this artificial trampling disturbance study with the effects of disturbance by actual grazing use.

Literature Cited

1. CRADDOCK, G. W. and C. K. PEARSE. 1938. Surface runoff and erosion on granitic mountain soils of Idaho as influenced by range cover, soil disturbance, slope, and precipitation intensity. U. S. Dept. Agric. Cir. 482.
2. LEVY, E. BRUCE. 1933. The point method of pasture analysis. New Zealand Jour. Agr. 46. 267-279.
3. PACKER, P. E. 1951. An approach to watershed protection criteria. Jour. Forestry 49(9):639-644.
4. ———. 1951. Status of research on watershed protection requirements for granitic mountain soils in southwestern Idaho. Research Paper No. 27, Intermountain Forest and Range Expt. Sta., Forest Service, U. S. Dept. Agric.
5. RENNER, F. G. 1936. Conditions influencing erosion on the Boise River Watershed. U. S. Dept. Agric. Tech. Bul. 528.
6. STEWART, GEORGE and S. S. HUTCHINGS. 1937. The point-observation plot (square-foot density) method of vegetation survey. Amer. Soc. Agron. Jour. 28:714-722.

Foliar Nitrogen and Growth of Certain Mixed and Pure Forest Plantings

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THE BENEFICIAL EFFECTS of black locust (*Robinia pseudoacacia* L.) on the growth of associated tree species has frequently been observed. Chapman[1] reported that total soil nitrogen and the heights and diameters of certain trees decreased appreciably with increasing distances from black locust stands. Further, decreases in heights and diameters of these trees were correlated with the decreases in total soil nitrogen.

Chapman and Lane[2] studied the growth and survival of some hardwood trees growing in associations with black locust, with pine (*Pinus echinata* Mill.), with sassafras (*Sassafras variifolium* (Salisb.) Ktze.), and in old fields having no tree cover. The best survivals and growth rates for the associated trees were found for the black locust association followed in order by pine, sassafras, and old fields. Deitschman[3] found that on spoil banks a black locust association[4] was superior to bare spoils or a shortleaf pine association for best survival and growth of the associated hardwood trees tested. The species tested may benefit from these covers by being protected from drying winds, large fluctuations in soil temperature may be reduced, and physical soil conditions may be improved. Black locust, a legume, may in addition to these benefits, augment the soil nitrogen supply.

The objective of this study was to compare the foliar nitrogen and the growth of certain forest trees in various covers as already defined.

[1]Chapman, A. G. The effects of black locust on associated species with special reference to forest trees. Ecol. Monog. 5:37-60. 1935.

[2]Chapman, A. G., and R. D. Lane. Effects of some cover types on interplanted forest tree species. Central States Forest Experiment Station. Technical Paper No. 125. 1951.

[3]Deitschman, G. H. Comparative survival and growth of trees planted under three types of overhead cover on strip-mind land in southern Illinois. Central States Forest Experiment Station. Station Note No. 63. 1950.

[4]To clarify the discussion which follows, *black locust cover*, *pine cover*, and *sassafras cover* are defined as the principal species among which the associated trees are planted. *Old field cover* consists of grasses, weeds, and native vegetation other than trees, as is often found on abandoned farm land.

Study Areas

The Central States Forest Experiment Station has, in the past, established a number of experiments for testing the adaptation of species to various sites. A number of these were used to supply the data for the present study. Five areas were studied, two of which are on the Wayne National Forest in southeastern Ohio. One of these, the Kehota Tract in Perry County, was strip-mined for coal in 1930. Several one-tenth acre plots located on the spoil banks were planted to yellow poplar and green ash 8 years after mining. These plots were interplanted with black locust the following year. The Dutcher Tract, an old-field site in Ohio, was planted in 1941. Yellow poplar was planted in alternate rows with black locust (50 percent) and also in pure stands. This same planting scheme was used for green ash.

Two areas in Illinois were studied—one a spoil bank and the other an old field. The spoil-bank plots are located in the southwestern part of the state near the city of Du Quoin. Stands of black locust

TABLE 1.—MEAN TENTH-YEAR HEIGHTS, DIAMETERS, AND TOTAL FOLIAR NITROGEN FOR TREES PLANTED IN BLACK LOCUST AND IN OLD FIELDS IN THE DUTCHER TRACT IN OHIO

Species underplanted and measurements	Cover	
	Black locust[1]	Old field[1]
Yellow poplar		
Height (feet)	17.1	4.5
D.b.h. (inches)	2.2	1.0[2]
Nitrogen (percent)	3.65	1.85
Green ash		
Height (feet)	20.0	6.0
D.b.h. (inches)	2.4	1.0[2]
Nitrogen (percent)	2.56	1.58

[1]All plots were essentially the same with the exception of cover.

[2]One inch or less.

and shortleaf pine, in a decadent condition at the time, were underplanted with a number of species in the spring of 1947. The size of the plots varied but was approximately 56 by 350 feet. The other Illinois area, in the southeastern part of the state, was an old-field on the Kaskaskia Experimental Forest. Natural and planted tree covers were underplanted with a number of hardwood species. The plots consist of two 20-tree rows each containing five species.

The fifth area is located near the city of Boonville in southwestern Indiana. The area, on spoil banks, was planted to black locust in 1945 and two years later the black locust was underplanted with a number of hardwood species. The plots are one-quarter acre in size.

Methods

On all the plots representative trees were selected for sampling. Suitable leaves were taken from the upper and southerly side of the sample trees for foliar analyses and all trees were measured for height and, in some cases, diameter breast high. Leaves from the trees on a single plot were placed in paper bags and air-dried. After the petioles were removed, the leaves were ground in a Wiley Mill. The ground samples were oven-dried to a constant weight at 70 degrees C, then analyzed for total nitrogen by an acceptable, modified, micro-Kjeldahl method. Total nitrogen was expressed as a percentage of the oven-dried weight.

Results

The results are summarized in the accompanying five tables. For the Dutcher Tract plots[5] foliar nitrogen, total heights, and d.b.h. in the case of yellow poplar (*Liriodendron tulipfera* L.) were greater for trees associated with black locust than for trees growing in pure stands (Table 1). The same trend is evident for green ash (*Fraxinus pennsylvanica* var. *lanceolata* (Borkh.) Sarg.).

On the Kaskaskia plots the trees of all five species associated with black locust averaged higher in foliar nitrogen and in total height than with any of the other four covers (Table 2). The next best results, all species considered, were obtained under pine, followed in order by sassafras, and old-field conditions. However, when each species is considered separately in relation to these three covers it may be seen that this order does not always hold.

On the Kehota mine-bank plots, for the three species studied, the foliar nitrogen and total heights were greater for trees associated with black locust than for those in pure stands (Table 3).

Green ash responded best to the locust cover, followed in order by yellow poplar and red cedar (*Juniperus virginiana* L.). The red cedar had considerably less foliar nitrogen under both conditions than the other two species.

Two covers, black locust and shortleaf pine, underplanted with five species were investigated on the Du Quoin, Ill., minebank plots. All species contained more foliar nitrogen and grew better when associated with black locust (Table 4). Of the five species, black walnut (*Juglans nigra* L.) and yellow poplar responded best to the effects of black locust cover; intermediate in response were silver maple

[5]Yellow poplar growing near (10 to 46 feet) the locust plots were intermediate in percent foliar nitrogen and total height in relation to the yellow poplar growing with black locust and yellow poplar in the pure stands. Lack of definite knowledge concerning the past history of this yellow poplar stand precludes its use in this report even though its inclusion would strengthen the case for the beneficial effects of black locust.

TABLE 3.—MEAN TWELFTH-YEAR HEIGHTS AND TOTAL FOLIAR NITROGEN FOR THREE SPECIES PLANTED WITH AND WITHOUT BLACK LOCUST ON SPOIL BANKS IN THE KEHOTA PLOTS OF THE WAYNE NATIONAL FOREST, OHIO

Species and measurements	Cover	
	Black locust	Pine
Yellow poplar		
Height (feet)	11.0	4.8
Nitrogen (percent)	2.34	1.41
Green ash		
Height (feet)	9.2	3.4
Nitrogen (percent)	2.47	1.47
Red cedar		
Height (feet)	8.2	4.2
Nitrogen (percent)	1.71	1.07

TABLE 2.—MEAN TENTH-YEAR HEIGHTS[1] AND TOTAL FOLIAR NITROGEN FOR SPECIES PLANTED IN FOUR COVERS ON THE KASKASKIA EXPERIMENTAL FOREST, ILLINOIS

Species underplanted and measurements	Cover			
	Black locust	Pine	Sassafras	Old field
Yellow poplar				
Height (feet)	16.6	5.5	6.3	3.5
Nitrogen (percent)	2.68	2.54	2.29	2.32
Green ash				
Height (feet)	5.2	5.1	2.5	2.8
Nitrogen (percent)	2.52	2.11	1.75	1.35
White oak				
Height (feet)	4.4	2.2	1.9	1.8
Nitrogen (percent)	2.32	1.98	1.94	1.84
Red oak				
Height (feet)	7.1	2.1	3.1	3.2
Nitrogen (percent)	2.74	1.84	1.90	1.75
Black cherry				
Height (feet)	14.1	6.9	2.7	2.5
Nitrogen (percent)	2.83	2.37	1.86	2.04
Means				
Height (feet)	9.5	4.4	3.3	2.8
Nitrogen (percent)	2.62	2.17	1.97	1.86

[1]Mean heights from Central States Forest Experiment Station Technical Paper No. 125, 1951.

TABLE 4.—MEAN FOURTH-YEAR HEIGHTS AND TOTAL FOLIAR NITROGEN FOR FIVE SPECIES UNDERPLANTED IN TWO COVERS ON SPOIL BANKS NEAR DU QUOIN, ILLINOIS

Species and measurements	Cover: Black locust[1]	Cover: Shortleaf pine[1]
Yellow poplar		
Height (feet)	8.5	1.8
Nitrogen (percent)	2.85	1.31
Green ash		
Height (feet)	3.2	2.0
Nitrogen (percent)	2.41	1.23
Silver maple		
Height (feet)	6.5	2.9
Nitrogen (percent)	2.32	1.28
Sweet gum		
Height (feet)	5.0	2.3
Nitrogen (percent)	2.45	1.41
Black walnut		
Height (feet)	7.3	1.6
Nitrogen (percent)	3.15	1.48

[1]Both cover species were in a decadent condition when underplanted.

(*Acer saccharinum* L.), and sweet gum (*Liquidambar styraciflua* L.); the least responsive was green ash.

On the Booneville mine-plots, pure plantings and plantings mixed 25 percent and 75 percent with black locust were studied. Three of the species had higher foliar nitrogen in the 75 percent black locust cover, while the fourth (silver maple) had higher foliar nitrogen in the 25 percent black locust cover (Table 5). Both yellow poplar and sweet gum were taller under the 75 percent black locust stand while red oak and silver maple were taller under the 25 percent stand. Sweet gum in both degrees of locust cover showed higher foliar nitrogen and greater growth than in pure stands. This was true for silver maple in the case of foliar nitrogen but not for height growth.

Discussion

The data presented show increased height and diameter growth and greater total foliar nitrogen for trees associated with black locust cover than for trees growing in other covers, with one exception.

Light and moisture undoubtedly influence the growth of the species associated with the several covers. However, the combined light, moisture, and nitrogen conditions under black locust produced greater growth of the associated species than those under the other covers. The other covers studied may furnish many of the advantages provided by black locust cover, but locust seems to contribute more available nitrogen. This is reflected in the foliar nitrogen content of the leaves of associated trees which, in turn, indicates the level of available soil nitrogen.

The fact that the species associated with black locust cover, in almost every instance, showed greater growth indicates that the sites investigated were below the optimum in available soil nitrogen, at least in the absence of black locust. Additional nitrogen will increase the growth rate only if nitrogen has been a limiting factor in growth. Covers other than black locust may have some effect on the level of available soil nitrogen. At Kaskaskia all species, except red oak, growing in pine cover had higher foliar nitrogen concentrations than were found in either sassafras or old-field cover. The sassafras cover was third best in this respect and the old field the poorest. The data indicate that a light tree cover is usually superior to old-field vegetation or bare spoil banks insofar as the levels of available nitrogen and the height growth of associated trees studied are concerned. The beneficial effects of light pine and sassafras covers on the level of available soil nitrogen must be indirect since, unlike black locust, these trees are not legumes.

TABLE 5.—MEAN SIXTH-YEAR HEIGHTS AND TOTAL FOLIAGE NITROGEN FOR FOUR SPECIES UNDERPLANTED IN TWO COVERS ON SPOIL BANKS NEAR BOONEVILLE, IND.

Species underplanted and measurements	Cover: 75 percent black locust	Cover: 25 percent black locust	Pure stand
Yellow poplar			
Height (feet)	6.1	6.0	...
Nitrogen (percent)	3.02	2.57	...
Sweet gum			
Height (feet)	6.9	5.6	4.5
Nitrogen (percent)	2.76	2.42	1.56
Red oak			
Height (feet)	5.1	6.1	...
Nitrogen (percent)	2.61	2.58	...
Silver maple			
Height (feet)	6.6	6.8	7.6
Nitrogen (percent)	2.42	2.76	1.71

Conclusions

1. Certain species of planted trees showed greater total heights and foliar nitrogen when associated with tree covers than on old fields or bare spoils.

2. Of the covers investigated, black locust was definitely superior to the others in increasing the foliar nitrogen levels and stimulating growth.

3. The beneficial effects of black locust are due, in part at least, to its ability to improve soil nitrogen conditions.

4. Of the species studied, yellow poplar, black walnut, and black cherry made the greatest response to improved soil nitrogen conditions provided by black locust; the other species, with a few exceptions, also responded but to a lesser degree.

Notes

New Methods for the Determination of Forest Tree Seed Germinability[1]

There has recently appeared in European literature discussion of methods of determining the germinability of tree seeds with 2,3,5-triphenyl tetrazolium chloride (TTC). Although the method has been used widely in the United States with many kinds of seeds, tests with forest tree seeds have been relatively few. The methods worked out by Lakon (*1*) and Lakon and Bulat (*2*) give some important refinements which are based on an extensive series of tests.

With beech (*Fagus sylvatica*) seeds the method is briefly as follows: The fruits are soaked overnight in water and then the hard outer coat cut off with a small sharp scalpel. Empty, malformed, imperfect, or rotten seeds are removed and their number counted. The intact, shelled seeds are put in water for 6 hours and the thin brown covering over the embryo and cotyledons removed with a lancet. These are left overnight (or better for 24 hours) in a 1 percent TTC solution at 30° C.

Seeds judged to be germinable are those with embryos whose radicles are entirely red or with embryos which are two-thirds red without any gaps in the red area, the unstained area being toward the pointed end. Also seeds with cotyledons that are at least one-half red in the area next to the radicle are judged to be germinable. The red area may have small uncolored spots without ruling them ungerminable. More exact determinations can be made by removing the cotyledons.

The method for various species of oaks is somewhat different. The soaked and decoated seeds (see above) are soaked 24 hours, washed in water and the outer thin brown layer peeled off. After repeated washing in water the two cotyledons are split open so that the embryo is in most cases left attached to one cotyledon. Such a cotyledon is left at least 24 hours at 30° C. in a 1 percent TTC solution. Embryos obviously rotten or destroyed are removed and their number noted. Briefly the determination of germinability is as follows: The embryo (or the original embryo anlage with new growth) and one-fourth of the inner side of the cotyledon in the region around the radicle must be red to be germinable. Very good correlations are indicated by their results, the variation between the TTC test and the germination tests being only about 5 percent at the most.

In the case of conifer seeds the method is quite different and it appears that it is easy to damage the tissue in removing the seed coats with the result that necrotic (noncolored) areas appear in the endosperm which would not be present if carefully handled. As a result of this difficulty Lakon suggests the following method of preparing the seed for soaking: A tip end of the seed (the narrow end) is cut off so that a very small surface of the radicle and the endosperm is exposed. No pressure must be put on the seeds. The cut seeds are soaked overnight and then placed in the 1 percent TTC solution for 40 hours at 30° C. The endosperm is then cut down one side and with the aid of pressure from the fingers is squeezed out. With the help of the lancet the embryo is removed. Necrotic areas either on the endosperm or the embryo alone are considered to render the seed ungerminable. Weakly stained seeds were also considered ungerminable.

Seed tests with *Picea excelsa*, *Pinus sylvestris*, *Larix europaea*, *Pseudotsuga taxifolia*, *Pinus strobus*, and several other species showed good correlations with the above precautions used.

It must be understood that in such comparisons of the actual germinability tests with the TTC tests the germinability tests themselves may be at fault. Lakon suggests cold-soaking certain species of seeds for 14 days before running the germination tests. In the present writer's experience it is essential to stratify seeds of many species of southeastern (U.S.A.) conifers before attempting the germination tests. It was found that during stratification the number of seeds showing a positive TTC test increased in 6 weeks of stratification at 40° F. as much as 20 percent, but the increase in actual germination far exceeded this figure. The best correlations in the work were obtained by comparing the TTC test before stratification with the germination tests after stratification.

It was also found that staining of excised embryos of longleaf pine (*Pinus palustris*), which are large and easy to handle, would occur when submersed for only 2 minutes in a 0.05 percent TTC solution. The color appears about an hour after removal from the solution and washing. Such stained embryos were found to be germinable in most cases, the cotyledon later turning green and the red color fading out in the remainder of the tissue after a few days. Unfortunately even this weak TTC treatment seems to have a retarding effect on growth so that it is difficult to compare the TTC test with the germination test on the same embryo.

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[1]The writer wishes to thank Dean C. F. Korstian for obtaining financial aid for the seed testing work conducted at Duke University in the laboratories of the Botany Dept.

Literature Cited

1. LAKON, G. 1950. Die Feststellung der Keimfähigkeit der Koniferensamen nach dem topographischen Tetrazolium-Verfahren. Saatgut-Wirtschaft No. 4, 83-87.

2. ———— and HELEN BULAT. 1952. Die Feststellung der Keimfähigkeit der Laubholzsamen nach dem Topographischen Tetrazolium-Verfahren. I. Die Fagaceen, Saatgut-Wirtschaft, No. 7, 166-168.

Part-Time Professor

The nearly 4,500 industrial foresters in the nation whose goal is increased woodland productivity in their company-served areas might follow the example of a Mississippi forester who became a part-time college professor.

Richard C. Allen, of the DeWeese Lumber Company, Philadelphia, Mississippi, heads up an ingenious program whereby 46 tree farmers in a 10-county region provide a source of raw material for DeWeese with their tree crops in return for free technical assistance.

One of the tree farmers in this area of flourishing woodlots is Dr. L. O. Todd, president of East Central Junior College at Decatur, Miss. The services Allen rendered in improving his 320-acre woodlot and his bank account impressed Dr. Todd.

He knew the college was located in the heart of a fine timber-producing region. Most of this timber was owned by small landowners and some of it was poorly managed. Sons of these woodland owners were enrolled at East Central and Dr. Todd considered the good that might be accomplished by teaching the students through the sons.

Like most presidents of small educational institutions, Dr. Todd is an old hand at squeezing a budget but he was unable to find financing for a course in forestry, even though he was convinced it could improve the economic climate of the whole region.

Dr. Todd outlined his problem to Forester Allen who offered to teach the course without cost to the school using the company's "Tree Farm Family" as a laboratory.

The course was a success from the day it began back in 1948. Under the program Forester Allen gives the college one day a week. His 1-hour lecture is followed by a 2-hour laboratory session with students studying forestry problems on the ground.

The father of one of the first students back in 1948 let the school have 140 acres of woodlands on a 20-year lease to be used as an experimental forest. DeWeese-managed tree farms also serve as demonstration units.

Each class plants 5,000 seedlings and records are maintained on each plantation. Visits are made to the nursery, pulp and paper, cooperage, lumber, and other woodworking plants in the area.

Today, 35 students are getting forestry credit at East Central. The average student, Allen says, is most impressed with the financial potentialities of farm woodlots. They are astonished to learn that a tree doubles in volume and stumpage value when it grows from 10 to 12 inches in diameter. The teacher hopes this knowledge will put a stop to the cutting of undersize trees in the area.

As Dr. Todd anticipated, students are bearing the forestry message to their fathers and the result is shown in improved management conditions in a wide area. Most of the students go home and take over the management of timber on their farms. Several have purchased additional timberland as an investment.

Two of Professor Allen's students went on to forestry school from East Central and are now his assistants at the DeWeese Lumber Company. One student Allen is most proud of has since become principal of a rural school in a heavily-timbered region. The area used to be notorious for the number of forest fires it experienced every year. This young principal, remembering his training under Allen, promptly started teaching his pupils the value of forestland and today fires are almost a thing of the past in that community.

All this because the president of a junior college decided it would be a good idea to offer a course in forestry and received the full support of the representative of a progressive lumber company.

ED DEMOTTE,
American Forest Products Industries, Inc.

C. A. Bittenger

(1908-1952)

Clarence A. Bittenger, a forester in the Pennsylvania State Forest Service at Clarion, Pa., died November 11 after a long illness.

He was born January 6, 1908 in Fayetteville, Pa., and received his B.S.F. degree from North Carolina State College in 1930. His professional career was spent mostly in the Pennsylvania Department of Forests and Waters, except for four years with the U. S. Forest Service in Illinois.

He became a Junior Member of the S.A.F. in 1935 and a full member in 1949.

Points of View

Forest Multiple-Values Need More Emphasis

The excellent article, "Management Planning on the National Forests," by L. S. Gross in the August 1952 JOURNAL neatly and logically described the development of plans for production, harvesting, and disposition of timber products. However, it did not go far enough. Concentrating emphasis on the timber crop, it devoted but one sentence to other forest crops and considerations. The statement that "coordination (with these other values) is attained on the ground in administration of the plan" is true only insofar as plans for crops or uses other than timber are developed in detail and as the responsible administrators are trained and interested in them

On most forest areas, timber crop harvesting is the biggest operation and has the most significant effects on the land. The timber crop is not, however, necessarily the biggest or most valuable crop even where timber volumes and values are high. In many areas the water yield is the biggest and most valuable forest crop, although it may pay no direct cash return to the forest owner or administrator.

The management objectives should then include first the protection of the soil on the land, for land and soil comprise the basic resource. Management prescriptions for a single crop should include in detail any specifications necessary in the considerations of other crops. In the essentials of the plan, the physical and economic descriptions of the management unit should state and give proportionate weight to all values concerned. The silvicultural system to be applied should be developed to make most efficient use of the soil resource not only for the timber, but for water, wildlife, and recreation. The transportation plan should be developed and executed with requirements of these other values in mind.

It may well be that these additional requirements will greatly modify existing plans. However, foresters must recognize—whether they like it or not—that they are not only producers of timber but also land managers, and that they will be called to account for all phases of multi-use management operations. They cannot afford, whether working on public or on private lands, to restrict too narrowly their field of interest and the scope of their management planning.

W. E. BULLARD,
Forester, Flood Control Surveys, Pacific Northwest Forest and Range Experiment Station.

Credit Where Credit Is Due

Presumably most readers of scientific articles signed by two or more authors (in the JOURNAL and elsewhere) are intrigued by the question of who has done what in its preparation. Similar speculation arises when one reads a one-author article which is obviously the culmination of work by a group of men. These questions which are but a matter of curiosity to the reader must be of vastly more concern to the contributors because in a very real sense *credit is the wage of scientific research.*

Reader speculation concerning authorship is necessary because, insofar as I know, there are no generally accepted standards for credit assignment. In one institution senior authorship may denote major contribution to the study, in another it may name the ranking staff man whose contribution may have been but nominal. In some cases, the routine executor of a project gets full credit while in other cases the editorial craftsman who puts the finishing touches on a major work may fall heir to the author's position.

Execution of a research project usually involves several steps of major importance, at least:

1. Problem analysis and general outline of study.
2. Preparation of detailed working plan.
3. Overall administration and logistical support.
4. Execution of study—field, laboratory, or library.
5. Analysis and weighing of results.
6. Writing report.
7. Rewriting report.

Obviously, if one man does all of these jobs, he deserves sole credit for the project. Ordinarily that is not the case, hence the problem of assigning proper credit.

I have no answer to propose. It would seem, however, that some system could be devised to indicate more accurately than the present system of signed authorship who has performed the various phases of scientific research.

R. N. CUNNINGHAM,
Lake States Forest Experiment Station.

Reviews

The Periodicity of Wood Formation.

By Kjeld Ladefoged. 98 pp. Illus. Ejnar Munksgaard, 6 Norregade, Copenhagen, Denmark. 1952. kr. 20.

Written in English, this publication reports the results of a study of 19 months' duration on the periodicity of wood formation in Denmark. The investigation covered 6 conifers (including Sitka spruce and Douglas-fir) and 13 hardwoods, both ring- and diffuse-porous. The literature of the field is well surveyed and the results of former studies have been compared with those obtained by this investigator. Special emphasis has been placed on the time and origin of cell division in the cambium, the course of wood formation and the time of its termination, and the change in the width of the vessels and tracheids during the growth period. The book contains several interesting photomicrographs and a large number of charts and tables, and is recommended to wood anatomists and plant physiologists.

Preliminary changes in the cambium are first noticed in March and April when temperatures start to rise. Cell division, starting at the bud base, begins about four weeks later. In ring-porous species, this division starts 1 to 9 days before the bursting of the buds; in conifers, 1 to 15 days and in ring-porous woods, 2 days to 1 week. Cell division in the lower trunk begins some days before or, at the latest, simultaneously with the bursting of the buds in ring-porous hardwoods and evergreen conifers. In diffuse-porous species and larch, cell division in the lower stem does not start until the leaves are partly or completely expanded.

In ring-porous hardwoods and the conifers studied, about half of the yearly wood formation is completed by May and June. After July, wood production is greatly reduced. In the diffuse-porous woods, one-third to one-half of the ring is formed in May and June and another third in August and early September. Growth in thickness (apposition) of the cell walls ends 2 to 4 weeks after cell division ceases. Summer or late wood formation begins from about mid-June to mid-July, depending upon the species and group.

The diameter of the spring-wood vessels formed in the ring-porous species is about three times larger than that of the diffuse-porous woods, although the total amount of conduction tissue is about equal for both groups. Total conductive tissue in the conifers is, however, 4 to 9 times greater than that of the hardwoods. In the ring-porous species studied, only the 4 outer rings are active in water transportation and 75 percent of the total takes place in the outermost ring. In the diffuse-porous woods investigated, many more rings (over twenty) are active in water movement although about ten percent of the total is conducted in the outermost growth layer.

NEWELL A. NORTON,
Department of Forestry,
The Pennsylvania State College.

Trees.

By Herbert S. Zim and Alexander C. Martin. 157 pp. Illus. Simon and Schuster, New York. 1952. Paper cover, $1; cloth, $1.50.

Pictorial rather than technical, this excellent little primer is subtitled "A Guide to Familiar American Trees." It is one of a series of popular nature guides sponsored by the Wildlife Management Institute. Other volumes are available on birds, flowers, insects, and stars. Later titles will include reptiles and amphibians, mammals, shells, and minerals.

In *Trees*, 140 species are illustrated by attractive paintings in color by Dorothea and Sy Barlowe. The main reliance on identification is by these plates which show form, flowers, fruit, and leaves. The descriptive text averages about one hundred words for each species. Latin names are not given.

Although much too elementary for the botanist and forester, and for students of these subjects, this book nevertheless has a definite place. The person casually interested in trees, who wants a simple means of identifying the more familiar genera and species, will find it useful. For, while written for the layman, the guide is based on scientific knowledge without being scientific in itself.

The color illustrations alone are well worth the modest cost of this handsome manual. Especially attractive are the double page plates on pine cones and leaves, on the leaves and flowers of the magnolias, and on oak leaves and acorns.

The Wildlife Management Institute, which over the years has sponsored many worthwhile scientific and popular publications in natural history, is to be commended for sponsoring this series of nature guides.

HENRY CLEPPER.

Economic Aspects of Wildlife Resources of the State of Washington.

By Robert F. Wallace. 42 pp. Bull. 19, State College of Washington Press, Pullman, Wash. 1952. $1.

It is generally enlightening when an authority in one field studies objectively his specialty in another field. Thus, it is fortunate for the wildlife profession that an economist should evaluate the economic aspects of game and fish resources of the State of Washington, the results of which are presented in this publication.

The strongest impression gained by the reviewer from this work is the author's emphasis on the dollar value of fish and wildlife in Wash-

ington, where in 1950 an estimated $100 million was expended "... for wildlife or in its pursuit." Of this sum, $80 million was spent by the state's 400,000 resident licensees, who reported an average cost of $200 per person. Canneries and other sources paid $20 million in 1950 for Washington's catch of commercial fish. In popularity among sportsmen, also in 1950, fishing ranked first, big game hunting second, upland game third, and waterfowl fourth; and licensees expended, respectively, $125, $88, $74 and $60 in pursuit of their favorite sport.

In appraising the overall value, Prof. Wallace states: "Wildlife resources probably have a relative importance in the economy of Washington which is unsurpassed in any other state and equaled in very few. There are probably many states that enjoy larger expenditures by nonresident sportsmen, and probably numerous states in which larger total expenditures are made by all sportsmen both resident and nonresident; but there are probably few, if any, others in which hunting and fishing outlays represent a larger proportion of income-creating expenditures within the state." And in summary, he concludes: "Although great caution should be employed in comparing economic data of dissimilar types, the total expenditure made for wildlife or in its pursuit during 1950 appears to have been of a magnitude comparable with many other important economic activities during the same year."

In these statements the author shows an open mind toward fish and wildlife as such; and he provides another block in the groundwork on which these resources are most prone to be evaluated—namely, their economic worth. The results of the investigation in question appear to be authoritative enough to convince skeptics, including legislators charged with responsibility for appropriations; and they are professional—or "wildlifey"—enough to impress the two or three thousand technically and/or experience-trained men now responsible for these resources over the entire North American continent. This report represents, therefore, a definite service to the wildlife profession.

The author properly gives major consideration to economics in this study. Other values are recognized only by implication: "... man ... may never be so happy as when with rifle, elk whistle, and packboard he disappears for several days into the lonely upper basins of a mountain valley and is in no communication with any living thing except, perhaps, for some lordly herd master bugling his defiance to the hunter's whistled challenge." To many, if not most, of the 3,000-odd men in the wildlife profession, and to untold thousands of nature- and conservation-minded folk, recreational and aesthetic values of fish and wildlife exceed the monetary consideration. In administration of these resources, however, aesthetics remain relatively intangible; and even recreation, however closely related to health and mental aplombness, is too often subordinated to economic reality. Thus, the author is not far afield. The reviewer, however, feels that, despite the economic nature of the work, it would have been enhanced if somewhat fuller recognition had been given to the very important qualities of spiritual and physical worth.

As to presentation, both the author and the State College of Washington Press have performed admirably. Of special interest to wildlife readers is the breakdown of expenditures, by hunting and fishing types, into 16 goods and service categories; and of further interest is the comparison of these totals with other industries in the state. As one example, Washington's wildlife, in 1950, represented nearly 20 percent of all agricultural income, including livestock! Also of value to professional readers is the author's discussion of wildlife evaluation studies in Colorado, Ohio, New Mexico, Florida, Texas, New York, and New Hampshire—none of which, however, appear to have been as complete, recent, or objective as the one here considered.

LEE E. YEAGER.

Publications of Interest

THE IBM MARK-SENSING system of continuous forest inventory is completely described in an eight-page illustrated booklet distributed by the International Business Machines Corporation without charge. Requests for the booklet, "Application Report 79," should be addressed to the International Business Machines Corporation,, 590 Madison Avenue, New York 22, N. Y.

LAKE STATES Forest Experiment Station, University Farm, St. Paul 1, Minnesota, issued 300 technical notes from May 1928 to July 1948 including information on all fields in which the station has conducted research. Just completed is an index listing all 300 technical notes by number and title according to the following subject matter classes: Forest Management and Silviculture, Regeneration (seed, nursery, planting), Mensuration (growth, volume, yield, sampling), Protection (fire, insects and diseases, wildlife), Forest Survey (forest resources), Forest Economics, Forest Influences (streamflow, erosion control, climate, shelterbelts), and General.

A copy of the index may be obtained by writing to the Station.

Advancements in Wood Research and Timber Engineering, a 31-page illustrated pamphlet published recently by the Timber Enginering Company, a research laboratory affiliated with the National Lumber Manufacturers Association, may be obtained without cost by writing directly to the company at 1319 Eighteenth St., N. W., Washington 6, D. C.

The Nebraska National Forest, issued in September 1952 to commemorate the forest's golden anniversary, is available from the U. S. Forest Service, U. S. Department of Agriculture, Washington 25, D. C. This historical survey is illustrated with photographs by Jay Higgins.

CALIFORNIA STATE Board of Forestry, Sacramento, has issued its 1952 report, to the Assembly Interim Committee on Conservation, Planning, and Public Works, written by State Forester DeWitt Nelson, in pamphlet form under the title *The Forest and Range Program of California.*

BULLETIN NO. 103 of the Forestry Branch of Canada's Department of Resources and Development in Ottawa is a report on *Wood Waste Utilization in Canada* by J. H. Jenkins, chief of the Forest Products Laboratories Division.

RESEARCH REPORT No. 24 of the Ontario Department of Lands and Forests, Division of Research, Ottawa, covers *The Classification and Evaluation of Site for Forestry* by G. A. Hills.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, The New York State College of Forestry*

Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

Conifers in Britain; An Illustrated Guide to Identification. By B. A. Jay. Illus. James Thin, Booksellers, 54, 55 & 56 South Bridge, Edinburgh. 1952. 35s.

Directory of Foresters in Louisiana, 6th ed. 33 pp. Louisiana Forestry Comm., Baton Rouge. 1952. Processed.

Forestry Educational Exhibits: How to Install and Maintain Them. By R. H. Odom. 23 pp. Illus. Louisiana Forestry Comm., Baton Rouge. 1951. I & E Bul. No. 1.

Oaks and Oak Wood. By A. G. Tansley. 50 pp. Illus. by Phyllida Lumsden. Methuen & Co., Ltd., London. 1952. Field Study Books. No. 7. 9s. 6d.

Some References on Forests and Related Natural Resources. 7 pp. U. S. Forest Serv., Washington 25, D. C. Sept., 1952. Mimeog.

Wood-Using Industries of Louisiana, 3d ed. 101 pp. Louisiana Forestry Comm., Baton Rouge. 1951. Mimeog.

Forest Economics

Commodity Drain from Forests of the Lake States 1950. By A. G. Horn. Lake States Forest Expt. Sta., St. Paul 1, Minn. 1952. Misc. Report No. 18. Mimeog.

Forest Resources

Area and Ownership of Forest Land in Sonoma County, California. By H. L. Baker and Adon Poli. 23 pp. California Forest & Range Expt. Sta., Berkeley. 1952. Forest Survey Release No. 14. Mimeog.

Forest Resources of Broome County. By J. E. Davis, M. J. Ferree, and N. J. Stout. 34 pp. Illus. State Univ. of New York College of Forestry, Syracuse 10. 1952. Forest Land Use Study Report No. 3. Bul. 28. 40 cents.

Forest Statistics for Southeast Georgia, 1952. By J. F. McCormack. 38 pp. Southeastern Forest Expt. Sta., Asheville, N. C. 1952. Forest Survey Release No. 39. Processed.

Logging and Milling

The Measurement of Forces Acting on the Outardes Pulpwood Booming System. By R. D. Collier. 2 pp. Illus. Canadian Pulp & Paper Ass'n., Montreal 2. 1952. Woodlands Sect. Index No. 1268.

Storage and Handling of Lumber at Wholesale and Retail Yards and Consumer Plants. By E. C. Peck. 17 pp. Illus. U. S. Forest Products Laboratory, Madison, Wis. 1952. Report No. D1919. Processed.

Pathology

Brown Stain in Pine Sapwood Caused by Cytospora Sp. By C. W. Fritz. pp. 349-359. Canada Dept. of Resources and Devel., Forest Products Laboratory Div. 1952. Reprint from Canadian Jour. of Botany, Vol. 30.

Cull and Breakage Factors and Other Tree Measurement Tables for Redwood. By J. W. Kimmey and E. M. Hornibrook. 28 pp. Illus. California Forest and Range Expt. Sta., Berkeley. 1952. Forest Survey Release No. 13. Mimeog.

Dry Rot in Wood, 5th ed. By K. St. G. Cartwright and W. P. K. Findlay. 36 pp. Illus. Great Britain Dept. of Scientific & Indus. Research, Forest Products Research, London. 1952. Bul. No. 1. 2s. 0d. (H. M. Sta. Off.)

Protection

The Effectiveness of Forest Protection. 8 pp. American Forest Products Industries, Inc., Washington 6, D. C. 1952.

Fighting Forest Fires with Water Bombs. By Q. F. Hess. 3 pp. Canadian Pulp and Paper Ass'n., Montreal 2. 1952. Woodlands Sect. Index No. 1246.

Polarizing Screens and Rangefinders as Aids in Forest Fire Detection. Canada Div. of Forest Resources, Ottawa. 1952. Fire Res. Leaflet No. 7.

Range Management

Field Book of Forage Plants on Longleaf Pine-Bluestem Ranges. By O. G. Langdon and others. 117 pp. Illus. U. S. Forest Serv., Southern Forest Expt. Sta., New Orleans, La. Occasional Paper No. 127. June 1952.

The Mesquite Problem on Southern Arizona Ranges. By K. W. Parker and S. C. Martin. 70 pp. Illus. Supt. of Documents, U. S. Govt. Print. Off., Washington 25, D. C. U. S. Dept. of Agric. Cir. No. 908. October 1952. 25 cents.

The 1951 Survey of Summer Elk Range in the Teton Wilderness Area. By A. A. Beetle. 5 pp. Wyoming Univ., Laramie, Wyo. Range Mangt. No. 51. September 1952.

North from Texas. By J. C. Shaw. 109 pp. Branding Iron Press, Evanston, Ill. 1952. $7.50.

Pitting and Other Treatments on Native Range. By O. K. Barnes. 23 pp. Illus. Wyo. Agric. Expt. Sta., Laramie. Bul. No. 318. July 1952.

Wintering Beef Cows on South Dakota Ranges. By L. E. Johnson and others. 26 pp. Illus. South Dak. Agric. Expt. Sta., Brookings. Bul. No. 419. May 1952.

Silviculture

Germination of Various Coniferous Seeds After Cold Storage. By G. H. Schubert. 7 pp. California Forest & Range Expt. Sta., Berkeley. 1952. Forest Res. Notes No. 83. Mimeog.

Growth of Mature Red Pine. By S. H. Spurr and J. H. Allison. 2 pp. Univ. of Minnesota School of Forestry, St. Paul 1. 1952. Minnesota Forestry Notes No. 9. Processed.

Growth of Selectively Cut Ponderosa Pine Stands in the Upper Columbia Basin. By A. L. Roe. 28 pp. U. S. Forest Serv., Washington 25, D. C. 1952. Agric. Handbook No. 39. 15 cents (Govt. Print. Off.)

Plant Forest Trees. By J. L. Gray. 10 pp. Illus. North Carolina Agric. Ext. Serv., Raleigh. 1952. Ext. Cir. No. 371.

Oak Pruning in the Missouri Ozarks. By P. Y. Burns and J. M. Nichols. 8 pp. Illus. Univ. of Missouri Agric. Expt. Sta., Columbia. 1952. Bul. No. 581.

Species Distribution and Soils in the Harvard Forest. By B. B. Stout. 29 pp. Illus. Harvard Forest, Petersham, Mass. 1952. Bul. No. 24.

Tree Farms

Tree Farms of the Western Pine Region. 8 pp. Illus. Western Pine Ass'n., Yeon Bldg., Portland 4, Ore. 1952.

Wood Technology and Utilization

Fence Posts, a Potential Market for Missouri Pine Timber. By K. L. Quigley and F. B. Clark. 12 pp. Illus. Missouri State Div. of Resources and Devel., Jefferson City. 1951.

Puun Lujuustutkimuksia I Pienet Virheettömät Mäntykockappalett (Investigations of the Strength Properties of Wood. I. Tests on Small Clear Specimens of Finnish Pine (Pinus sylvestris). By F. E. Siimes and Osmo Liiri. 88 pp. Illus. Valtion Teknillinen Tutkimuslaitos, Helsinki, Finland. 1952. Tiedoitus 103.

Timber Drying, 3d ed. By R. G. Bateson. 143 pp. Illus. Crosby Lockwood, London, S. W. 7. 1952. 15s.

Wood Chemistry, 2d. ed. By Louis Wise and E. C. Jahn. 2 vols. Reinhold Publ. Co., New York. $15.00.

Wood Waste Utilization in Canada. By J. H. Jenkins. 12 pp. Canada Dept. of Resources and Devel., Forestry Branch. Ottawa. 1952. Bul. No. 103.

Society Affairs

Officers and Members of the Council, 1952-1953

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Reports of Officers, Committees, and Council Meeting
Fifty-second Annual Meeting, Society of American Foresters
Montreal, Canada, November 17-20, 1952

The annual Society Affairs session was held in the Mount Royal Hotel, Montreal, on November 18, 1952. President George L. Drake presided.

The following reports by the officers and committees of the Society were presented. Members are urged to read these reports as they indicate the far-flung activities of the Society in behalf of the profession.

A resolution was proposed by Vice President E. L. Demmon and unanimously approved by the members present. Mr. Demmon then appeared before the business meeting of the Canadian Institute of Forestry in session at the same time, and read the resolution which was accepted with thanks by the C.I.F. officers and members.

Report of President
George L. Drake

For the first time in the history of the Society, we are holding our annual meeting outside the boundaries of the United States.

This is significant of the growth of the forestry profession in North America, not alone in numbers but in influence, especially in making our part of the world forestry-minded. It is also formal recognition by the Society of our Canadian members. It brings attention to the fact that boundary lines, fixed by treaties between men, do not control forest types and that many of our forestry problems are common to both sides. This is particularly true of fire, disease, and insects—where coordinated effort is so important if we are to keep these enemies of the forest in check.

Through the years, groups such as ours tend to develop a pattern of annual meeting that becomes more or less stereotyped; and it is well that we get a glimpse of how our neighbor-foresters approach the same problems. This joint meeting will give us that opportunity.

Most pleasant of all are the personal contacts that develop in a meeting like this with its wide-spread attendance. Personal acquaintance with your fellow foresters leads to a feeling of freedom to discuss problems of common interest, not just at the moment but also through the years.

The Society Grows

The past year has shown a healthy growth in membership. This reflects the growth of the profession and the realization by foresters that their professional society, through its meetings and professional journal, supplies a real need if they are to keep abreast of developments in forestry. The membership committees in the Sections have been very effective in bringing qua'ified men into the Society. As a So-

A RESOLUTION OF APPRECIATION

It is hereby resolved, by unanimous vote of the members of the Society of American Foresters present at the Society Affairs session in Montreal on the afternoon of November 18, 1952, that:

1. The Society of American Foresters officially records its gratitude to the Canadian Institute of Forestry for inviting the Society to hold this joint meeting.

2. The Society expresses warm thanks to the Institute for the opportunity afforded by this meeting to advance professional knowledge and to heighten the long-standing friendship between our two organizations.

3. The members of the Society appreciate the enjoyable and generous hospitality shown them by their Canadian colleagues, and the efforts of the Institute's officers and committees who have worked so diligently in planning and arranging this meeting.

4. The Society herewith extends a cordial invitation to the Institute to hold another joint meeting at a mutually convenient place and date in the United States.

Be it further resolved that, the Canadian Institute of Forestry concurring, this occasion shall be the forerunner of a continuing series of joint meetings to be held periodically at suitable intervals with the objectives of cementing professional solidarity and of advancing the techniques and practice of forestry in North America.

ciety we represent and serve our profession; and as we gain in strength, our capacity to serve our members increases.

One of the most encouraging trends is the increasing participation in the affairs of the Society by its younger members. These are the men who are doing things in the woods. The enthusiasm of youth, tempered by the more mature judgment of older members, cannot but build a stronger Society.

In many parts of the country, where Section boundaries embrace large areas and where the forest industry is active, there is an amazing number of foresters in the woods. The resulting growth of Chapters has been healthy for the Society and for the profession. One has but to attend these Chapter meetings to sense the keen interest these men have in their calling, and the realistic manner in which they grapple with their local forestry problems. The Chapters have strengthened rather than weakened the parent Sections.

In the Columbia River Section, the Chapters are the dominant bodies, meeting frequently, with excellent attendance. Their chairmen make up the policy committee of the Section, bringing to it a cross-section of the thinking of the membership. Today the parent Section holds only an annual meeting following a field day, preceded by a meeting of the policy committee. These trends indicate we are a virile organization, awake to the needs of the members.

Illustrative of the part the Society is taking locally in encouraging better forestry is the active interest taken in the *Keep Green* movements. Two examples have come to my attention. In recognition of the fine cooperation of certain radio stations in Oregon, the Columbia River Section has given these stations appropriate citations and plaques. In Washington the Puget Sound Section, for the past two seasons, has put on the air over one of the Seattle radio stations, a 15-minute program called *Green Gold*. Dean Gordon Marckworth, as moderator, has given freely of his time in preparing interesting programs, serving all phases of forestry, in the form of round-table interviews with foresters and educators. This program has rated high in the local Hooper poll, and accordingly has been given a choice spot at dinner time on Saturdays. The more interest we as foresters take in local affairs, the greater our influence in advancing the cause of sound forestry.

Never in the history of American forestry have the standards and quality of professional education been so high as they are today. The Society can justly take some credit for this fact, through the continuing work of our Committee on Accrediting, always with the advice and assistance of the Division of Education. Let us keep these standards high.

The leadership of an organization like ours rest largely in the hands of its governing body—in this Society, the Council. It has been a great privilege to work with your vice president and the men you elected to the Council. Representing an excellent cross-section of the Society membership and with a mixture of old and new blood, their approach to the problems before the Society has been open-minded and realistic. The question in which the membership has shown great interest, viz., the proposed changes in membership bylaws, will be discussed at this meeting by a member of the Council.

The appointment of a full-time editor for the JOURNAL fills a long-recognized need. A. G. Hall, who had asked to be released from his part-time duties as editor of the JOURNAL, has made a real contribution to the Society, and his efforts have been appreciated. The work of Miss Warren as business manager of the JOURNAL, and of Lloyd Thorpe as advertising representative has been valuable in keeping the JOURNAL on a sound financial basis. Rising costs, however, have necessitated an increase in the subscription rate for the JOURNAL if it is to maintain its high standing. This is the first increase in subscription price of the JOURNAL since January 1947.

Under the able guidance of Henry Clepper and his efficient staff, the spade work of maintaining our Society continues to be well done. Through his personal contacts with the field, Henry has helped weld us more closely together.

I have been able to meet with the Allegheny, Intermountain, Columbia River, and Puget Sound Sections, as well as some of the Chapters during the year. I plan to meet with other Sections during the coming year. These meetings have been very stimulating to me—one is impressed with the down-to-earth approach to the problems of the respective regions.

At the request of the Chief of the Forest Service, I have represented the Society at two meetings: one on planning for the 1954 World Forestry Conference; and the other on the Timber Resource Review. I trust my position on the latter meets with the approval of the membership; namely, that the information compiled be factual and realistic, and that in making the Review the current activity of the Forest Service in the Forest Survey and in the administration of the national forests, especially in timber management and forest research, be not curtailed.

Problems Ahead

The problem of finances is apparently always with us. We are living within our budget, but rising costs and the growth of our Society accentuate many of the problems that have been brought to your attention at these annual meetings.

Our quarters in Washington are cramped and inadequate for safe and convenient storage of our growing files. As our finances will permit, we hope to remedy this situation.

In his annual report to the Society in 1948, President Martin stated: "One of the principal organizational adjustments needed by our Society is a procedure through which the maximum number of our members may be informed of problems facing the national Society, be given an opportunity to study these problems, and then pass on their opinions to the Council in time to guide Council action." During this past year we have attempted to do this with regard to the question of membership, and the response from the Sections has been very helpful.

As a virile organization there will always be honest differences of opinion but with understanding and cooperation there need not be tension. The Council welcomes your comments.

In matters of national forestry problems, the Society has and will be asked to take a definite position on many of the issues. Under the able leadership of President Evans, the Council (in 1950) adopted a policy prohibiting its officers or employees from lobbying for or against legislation. This was not intended to weaken our position if issues arise affecting the interest of the entire profession; and your officers will continue to carefully weigh the facts in each case.

In commenting on our accomplishments of the past year, I mentioned the part some of our Sections are playing in getting actively behind the *Keep Green* movements in their areas. This is the type of leadership in forestry matters we should strive for in our communities.

You might be interested to know how such effort pays off. My home county, Mason, is one of the most heavily forested areas in the State of Washington, embracing some 600,000 acres, most of it second growth. The region is well watered, and lying close to the large cities on the Sound, we draw many fishermen and hunters.

Initiated by local foresters and now enthusiastically supported by the people of the county, each year there is staged the Mason County forest festival, at the beginning of the fire season. This is not just another Paul Bunyan type jamboree, but is dedicated to the growing tree, with fire as the villain. Our good friend James Stevens writes script for a pageant put on by some three hundred children of the local schools. As a result our citizens, young and old, have become keenly fire-conscious. This has paid big dividends. During the past three years, which have been critical fire hazard years, the acreage burned has been only 1/62 of what foresters in the past have accepted as an allowable annual fire loss.

Considering the fire losses in other parts of the country that we read about this year, it would seem that we as foresters have a real job ahead—to spread the gospel of fire prevention. The more interest we take in local problems, the more we gain in respect and leadership in our communities; and once this respect is gained, the more weight we have in other sound forestry matters. In this type of tree-root forestry, the Chapters should be very effective.

The eleven subject-divisions of the Society, through their well-rounded-out programs which have been a stimulus to technical knowledge, have been very effective in heightening interest in our meetings, and in bringing about increased participation in the affairs of the Society by an ever larger number of members. A word of caution should be raised on the problem of our becoming overorganized. As the number of divisions has increased, so has the problem of scheduling Division meetings at our annual meeting, to avoid duplication and overlapping. Division meetings have been combined when practical, to cut down the number of meetings and to make it possible for the membership to attend more of these Division meetings. As individuals we naturally are interested in certain phases of forestry that affect our job or interests; but let us not become so wrapped up in our own interests that we lose sight of the problems of our fellow foresters. Many of our problems are common.

Your Council and your officers appreciate the fine support of the membership; and with your constructive criticism and suggestions will work toward continuing to make your Society the leader in better forestry.

Forestry as a profession has "come of age," and to the professional foresters the country looks for leadership. As we demonstrate in our respective areas that forestry is a sound enterprise and that our ideals are high, so will we maintain our high standing as a profession whose objective is service, not just for today but for the future.

Report of the Executive Secretary

Henry Clepper

The annual progress of a professional society is ordinarily not measured by big events and spectacular accomplishments, but by small gains and minor advances; or as the military phrase has it, "by consolidating our positions."

Finances

In 1951, for the first time in our history, our income reached $100,000. For the fiscal year 1952 our income was approximately $107,000.

About one-third of our income ($36,700) goes to print and distribute the JOURNAL OF FORESTRY. This expense is exclusive of salaries.

During the past fiscal year the Society operated in the black, with net earnings of $1,188.

The budget for 1953, as approved by the Council, shows estimated income and expense at approximately $113,000. This is a balanced budget; no deficit financing is contemplated.

In the report of the Council meeting will be found a table showing detailed comparisons of expense and income for 1951 and 1952, and the budget for 1953. Any member who desires additional information about any item

TABLE 1.—MEMBERSHIP BY GRADES AS OF NOVEMBER 30, 1945-1952

Grade	1945	1946	1947	1948	1949	1950	1951	1952
Student	0	0	0	0	0	0	550	550
Junior	2151	2648	2954	3058	2909	3315	3861	4245
Member	1891	2037	2304	2699	3205	3195	3467	3563
Fellow	37	43	43	51	48	57	54	62
Affiliate	125	145	167	186	207	209	269	381
Associate	135	149	174	186	193	198	206	213
Corresponding	33	34	38	49	53	52	55	58
Honorary	10	9	10	12	13	12	13	13
Total	4332	5065	5690	6241	6628	7038	8475	9085
Increase	40	683	625	551	387	410	1437	610

TABLE 2.—S.A.F. MEMBERSHIP BY SECTIONS NOVEMBER 30, 1952

Section	Rank	Total	Student	Junior	Member	Fellow	Affiliate	Associate
Allegheny	7	567	45	264	226	4	11	17
Appalachian	4	616	29	316	250	4	11	6
Central Rocky Mountain	15	258	16	97	136	0	5	4
Central States	5	614	94	312	183	2	11	12
Columbia River	2	804	37	420	301	4	29	13
Gulf States	6	604	21	286	213	2	68	14
Inland Empire	17	198	14	99	75	1	6	3
Intermountain	18	181	6	71	103	0	1	0
Kentucky-Tennessee	20	173	4	69	87	0	7	6
New England	8	553	25	227	242	4	35	20
New York	10	380	26	152	175	4	10	13
Northern California	3	724	41	327	286	8	40	22
Northern Rocky Mountain	19	179	7	82	86	2	1	1
Ozark	13	318	29	142	102	1	39	5
Puget Sound	9	482	45	221	174	4	31	7
Southeastern	1	850	48	522	233	2	29	16
Southern California	21	117	5	61	37	2	9	3
Southwestern	16	202	0	101	90	0	9	2
Uppper Mississippi Valley	12	358	47	152	139	1	11	8
Washington	14	264	1	52	172	12	0	27
Wisconsin-Upper Michigan	11	365	10	168	155	2	17	13
No Section Affiliation[1]		207	0	104	98	3	1	1
Corresponding Members		58						
Honorary Members		13						
Total membership		9,085	550	4,245	3,563	62	381	213

[1]Includes members in U. S. and foreign countries who have requested that they not be designated as members of any Section.

in the budget, or about the Society's financial operations in general, is welcome to request it.

Membership

Table 1 shows membership by grades for each of the past eight years (1945-1952). It will be seen that since the end of World War II our membership has more than doubled.

At the close of the fiscal year 1952, our membership totalled 9,085; the net increase during the year was 610. Terminations through death, resignation, and failure to pay dues numbered 459 or less than 5 percent of our total membership. During 1952, the applications of 1,750 persons were processed by the executive office for admission, advancement, and reinstatement.

One of the Society's most notable developments was the establishment of the Student Member grade, open to junior, senior, and graduate students not eligible for Junior Membership enrolled in approved curricula at colleges and universities accredited for professional forestry. In 1951, the first year this grade was open, 550 Student Members applied and were elected. Student Members now number 550.

The advantages of this grade are worth restating. First, it enables students to become identified with their professional society and to participate in Section and Chapter meetings while still in school. Thus they early gain knowledge of professional affairs and enlarge their professional acquaintance, which is often helpful when they later set out to find employment.

Secondly, the Student Member pays annual dues of only $3 for which he receives the JOURNAL OF FORESTRY. But more than that, on his advancement to the Junior Member grade upon graduation from school he does not pay the customary admission fee of $5, nor does he pay the higher Junior Member dues of $6 during the year in which he is advanced.

Table 2 shows the number of members in all grades by Sections.

Before leaving this subject, on behalf of the Council I want to pay sincere and thankful tribute to the Section membership chairmen, to the Section and Chapter membership committees, and to the membership representatives at each of the schools. Year in and year out, these faithful workers render services to the Society that are absolutely indispensable to its growth and existence. (I never fail to remember them in my prayers nightly.)

Publications

During the past year the Society published and put on sale the *Third Cumulated Index* of the JOURNAL OF FORESTRY, covering the period 1940-1950. This valuable adjunct to our periodical literature was compiled by a committee of the Appalachian Section under the chairmanship of Prof. W. D. Miller of North Carolina State College. Committees of the Appalachian Section compiled also the first and second cumulated indexes. The profession now has available complete indexes of the old *Forestry Quarterly* dating from 1902, the *Proceedings of the Society of American Foresters* dating from 1905, and the JOURNAL dating from 1917, through the year 1950.

The Foresters' Manual, which has been in preparation since 1947 by an Editorial Committee and 19 subject matter committees, will be completed by the end of 1952 and delivered to a commercial publishing house for publication in late 1953. The book will be similar to the technical handbooks used by engineers and other professional workers. It is expected to comprise about 750 printed pages.

Three bulletins, which should be completed in 1953 and which will be published by the Society, are *Forest Types of the United States and Canada, Grade Standards for Forest Planting Stock*, and a professional guidance booklet for prospective students of forestry.

Editor of Publications

During 1952, the Council found it financially possible to take action on an important matter which had been its goal since 1948. In that year the Council unanimously went on record in advocating "the establishment of a staff office on publications as the next major expansion of the budget." Although reaffirmed in 1949 as a desirable objective, the Council was unable to finance the proposal.

Again in June 1950 "the Council unanimously went on record to employ a full-time editor at the earliest practicable date, and directed the executive secretary to present to the Council at its December 1951 meeting a list of possible candidates and the budget needed to carry out this proposal in 1952."

Then, at long last, at the Council meeting in June 1952 a list of well-qualified candidates was reviewed, and the position of paid Society editor was offered to Arthur B. Meyer, who accepted and reported for duty in September. Mr. Meyer has his own report to present to the members, hence I shall not duplicate any part of it now. However, I desire to repeat the foregoing facts for the record. In the September issue of the JOURNAL there was published an announcement of his appointment together with a detailed explanation of the duties he performs.

Before closing this portion of my report, I desire publicly to thank Albert G. Hall for his services to the Society as part-time paid editor of the JOURNAL during the period February 1951-August 1952. Mr. Hall was not a candidate for the position on a full-time basis.

Section Bylaws

The Constitution of the Society (Article XI, Section 3) provides as follows:

"Any Section may, subject to the approval of the Council, adopt for its own government such bylaws as it may find expedient, including the qualifications for associate members of the Section, provided that no part thereof shall conflict with the Constitution of the Society."

All the 21 Sections operate under Bylaws and have done so for years. However, some of these Bylaws, while not in conflict with the Constitution, are inconsistent in that Section boundaries are not always exactly defined and in some cases there are duplications in the territories claimed by adjoining Sections. Although the Council desires that the individual Sections enjoy complete autonomy in the operation of their affairs under the Constitution, at the same time the Council believes that an impartial review of all Section Bylaws may be desirable. The purpose of the review is to eliminate inconsistencies and to provide uniformity in Section business procedures, especially as regards the election of officers, membership activities, the administration of Chapters, and similar matters.

The Council has authorized the formation of a special committee to review all Section Bylaws and to make suitable recommendations. President Drake has appointed the following members to serve on this committee:

Chairman, George R. Phillips, former chairman of the Washington Section.

Theodore H. Davis, former chairman of the Appalachian Section.

W. Harold Horning, former vice chairman of the Columbia River Section.

Bert R. Lexen, former chairman of the Central Rocky Mountain Section.

Roland Rotty, former chairman of the Southwestern Section.

Section officers are urged to cooperate with this committee in order that its assignment may be completed promptly. All Sections will have an opportunity to review the committee's report and recommendations.

Additional items concerning the activities of the executive office are published in the report of the Council meeting in this issue.

Report of the Editor

Arthur B. Meyer

Comments by editors of the JOURNAL OF FORESTRY and Council deliberations have for several years touched quite often upon the need for a full-time employee of the Society to concern himself with processing and editing the Society's publications, including the JOURNAL.

It is my privilege to appear before you today in that capacity.

Because of the fact that my duties have covered a period of about two months, you will appreciate that in reporting to you on editorial affairs during the calendar year 1952, I am reporting upon the work of others.

The JOURNAL in 1952

With the appearance of the December issue, Volume 50 (1952) of the JOURNAL OF FORESTRY will total 964 pages, exclusive of index, table of contents and covers.

This is 20 pages larger than in 1951, 52 pages larger than in 1950. This volume carries a total of 124 articles (478 pages), 63 Notes (54 pages), 10 Points of View (12 pages), 2 We Present features (4 pages), 83 book reviews (60 pages), 12 pages of Current Literature, 116 pages of various Society Affairs matters, 73 pages (371 items) of Forestry News, 155 pages of advertising, and no editorials.

In comparison with last year this indicates an increase in the number of articles (124-112) and Notes (63-52). This is the result of conscious effort toward such an increase. A growth in advertising space is also shown and about 16% of the total inside pages were so used.

There was a slight decrease in Society Affairs, due primarily to dropping publication of certain lists judged to be nonessential, and in Forestry News. This year there were only half as many Points of View and We Present features as last year. This is due primarily to the lack of receipt of material for these departments.

The subject matter of the 124 articles which appeared in 1952 indicates a definite increase in those dealing with silviculture, with pathology and entomology, and with general subjects. There was also a slight increase in utilization articles.

A small decrease shows up in the number of range management, forest management and engineering, influences and soils, and fire articles.

Wildlife, world forestry, and recreation remained about the same as the previous year.

A classification of the affiliations (employment) of the authors of these articles may be of interest:

Thirty-four percent of our authors were connected with federal or state research agencies, 24 percent were on college faculties, and 12 percent came from miscellaneous federal agencies other than the Forest Service. Forest Service men who wrote for the JOURNAL, but were not working in research, accounted for 8 percent of the articles. Industry, state service, and miscellaneous employment accounted for 6 percent each. Three percent of the authors were employed in industrial research.

At the present time there is a backlog of 59 accepted articles waiting publication. At the current rate of publication of 10 per month this is a six months' supply. In itself that is not large, but there are 19 articles waiting the decision of the associate editors and each annual meeting is likely to add enough articles for 3 or 4 issues.

During the year, 135 articles were received for consideration by the editors. Twenty-eight manuscripts were returned to the authors, mostly for revisions recommended by the associate editors. A few, which covered subjects of questionable importance or matters already covered in other manuscripts, were rejected.

(No article, however, whose subject matter warrants the attention of the Society, is rejected on the basis of its preparation. If the information is good and the presentation poor, the author is assisted in putting it in shape for publication.)

These foregoing statistics and others, which could be presented from the 1952 history of the JOURNAL, can be interpreted to indicate various developments and trends, various problems. Perhaps a few of the most important are as follows:

First—a definite effort is being made to give more space to full-length articles and notes. Prompt publication of all worthy material is still a definite problem, but it does not appear to be much greater now than at other times through the last 10 to 15 years.

Second—Advertising revenues are on the increase. (This should eventually provide a means for printing more articles by financing a larger JOURNAL.)

Third—Articles seem to be keeping pace with professional developments—with the notable exception of those dealing with forest management, especially as applied to private and industrial lands. There is a dearth of these.

Fourth—We are relying to a large degree upon our members in research and teaching to prepare articles.

Fifth—The JOURNAL is following a "middle of the road" course. We are attempting to have something of interest and value for any professional reader in one or another of the various departments. *But* we are still holding to our basic purpose as a scientific and professional publication.

Many other points could be developed by scrutinizing Volume 50 of the JOURNAL. Different interpretations might reach different conclusions. I doubt, however, that any searcher would fail to agree on one important point.

The JOURNAL is a mirror reflecting the knowledge, interest, and effort of the Society. It is the product of many people.

Albert Hall, editor from February 1950 to October 1952, once said that he didn't see much use in making an annual report to the members, for he made a detailed one with each month's issue. The high quality of Mr. Hall's reports has been self-evident and will stand to his lasting credit with the Society.

There are many readers, though, who may not fully appreciate the fact that any publication is the product of teamwork. The editor might be viewed as the quarterback, but he does not play alone.

Behind the editor of the 1952 JOURNAL there were many people.

There was Miss Warren, whose valued business management is the product of many years experience and close association. There was our advertising representative, Lloyd Thorpe, who has done much to increase advertising and its revenue, working closely with Miss Warren.

There was the managing editor, Henry Clepper. He not only guides JOURNAL policy, but out of his long

experience contributes in various ways to each issue.

There was the Council itself, with an active interest in the JOURNAL and basic responsibilities for its policies and performance.

Perhaps least recognized of all workers are the 12 associate editors. These men stand behind the professional reputation of the JOURNAL. They pass upon the worth of submitted manuscripts ,guarantee technical soundness, and contribute of their own knowledge and experience to the authors' works, in addition to advising the editor.

Most important of all is the membership of the profession. The 124 articles, the 63 notes, the 83 book reviews, in fact almost all of the pages of the JOURNAL, represent many days of hard work by many individual authors and by associated persons who gave aid and advice. The success of any publication is measured by the worth of what its contributors have to say and by their ability to say it. All other persons involved in the process of publication merely augment the efforts of the writers who create the material out of their knowledge and ability.

The JOURNAL runs through a circle which begins with Society members as its creators and ends with Society members as its users.

These things I see in the statistics *and* behind the statistics which represent Volume 50 of the JOURNAL OF FORESTRY.

Society Publications in the Future

It is only reasonable that you should expect me, as a new editor and full-time employee of the Society, to say a little something about the future.

There are a number of miscellaneous publications which are demanding attention and work. The *Forester's Field Manual*, which is about completed through the efforts of many members, will require final touches before publication.

A professional guidance bulletin for prospective foresters is in process but requires further effort.

A revised style manual for contributors to the JOURNAL is to be compiled.

Grade Standards For Forest Planting stock and *Forest Types of the United States and Canada* both, though in preparation by our membership, will need some final work by the Office of Publications.

There are a half dozen articles awaiting preparation that have been requested by various organizations and magazines.

There is much to be done other than that required by the JOURNAL.

As to the JOURNAL, which is the number one task of the Society's editor, I can very briefly express my personal attitude:

The JOURNAL OF FORESTRY represents a half century of energetic and devoted effort by many of the best minds of our profession during that period. It is the product of many people, in the past and the present, working together.

Any forester assuming duties as its editor should concern himself first with maintaining the JOURNAL under his stewardship according to its past high standards and soundly conceived policies.

He should concern himself secondly with keeping abreast of professional developments in forestry. He should anticipate the need for changes in the magazine and suggest their nature, but inaugurate them only with the approval and backing of the profession.

I conceive of the job as one which requires, not a new broom but rather some fine sandpaper, a polishing cloth, and available time to inspect the corners of the room.

Report of the Council Committee on Membership

The question of adopting a set of minimum standards or minimum course requirements for approval of curricula in accredited forestry schools and the provision of a membership grade to which graduates of nonapproved curricula in accredited schools could be elected immediately upon graduation have been the principal items that have concerned the Committee on Membership and the entire Council during the past year.

The background material for the problems facing the Council on these questions was presented in the August 1952 JOURNAL OF FORESTRY under the report of the midyear Council meeting. Pertinent excerpts from this report are included here so that all will be clear as to the issues and reasons for the actions taken:

The principal point of issue was the effect of the Council's action in approving specific curricula offered in accredited schools for the purpose of determining which graduates were eligible for Junior Membership immediately on graduation.

At the request of the Council, the committee on accrediting in October 1949 recommended certain educational requirements as a qualification for Junior Membership. This recommendation was embodied in Bylaw 5, adopted by the Council at its meeting in December 1950.

Bylaw 5 defined the minimum educational qualifications for those graduates of accredited institutions who would henceforth be eligible for Junior Membership immediately upon graduation.

Considerable misunderstanding and some criticism followed. For it was found that the graduates of certain schools, who had majored in curricula which previously had been accepted as adequate for Junior Membership, were no longer eligible for the Junior grade immediately upon graduation. The reason they were no longer eligible was because the curricula they had followed did not contain the background and professional courses which the Council, in adopting Bylaw 5, had established as the minimum requirement for immediate admission to the Society at the Junior Member level.

In essence, the dissatisfaction with Bylaw 5 centered on the criticism that these professional courses, together with certain foundation science courses which were also specified, constituted too rigid a requirement. One of its most controversial effects was that at some schools, but not all, graduates in utilization and wood technology were not eligible for the Junior grade immediately upon graduation.

At a meeting in June 1951, the Council decided not to amend Bylaw 5 at that time, but to give further study to its operation, and to invite further study by the membership at large. In order to focus attention on the subject, an open panel discussion on membership requirements was scheduled for the annual meeting of the Society in Biloxi, Miss. in December 1951.

The panel discussion was duly held. Many members participated. From the discussion it was quite evident that many members felt that the course requirements of Bylaw 5 were too restrictive and should be modified. Many members on the other hand felt that the qualifications established under Bylaw 5 were satisfactory and should be maintained. A sizable group of members, numbering among them most of those who had given the matter real study, felt that with some modification these requirements could be changed so that they would be acceptable to most members.

As a result of this open discussion at Biloxi, the Council instructed the executive secretary to send to the Sections certain background information pertinent to the subject, and to invite the members, at their Section and Chapter meetings, to acquaint themselves with the issues. In addition, the Council requested the Sections and Chapters to try to determine the sentiment of the members on certain specific questions on which the Council desired an expression of membership opinion.

It was also decided by the Council that if a formal referendum to amend the Constitution would be found necessary, the referendum would not be held until after the members had had a full year of study and discussion.

During the period January through June, 1952, nine Sections and eleven Chapters conducted opinion polls, based

on the material sent out by the executive office. In addition, numerous helpful individual letters were received. Since June added Section and Chapter expressions have been received which in general agreed closely with the earlier opinions.

As a result of this survey, the Council found so much agreement among members relative to the need for a minimum course requirement for approval of curricula that it considered a referendum unnecessary, and at its meeting on November 17, 1952 approved as a substitute for the controversial minimum course requirements of Bylaw 5 the following:

"For a curriculum to be approved it must include not less than one 3 quarter-credit course in each of the following subjects: silviculture, forest management, forest protection, forest economics, and wood utilization."

The Council wishes to emphasize that these minimum course requirements in no way relate to minimum training considered essential for foresters. They are a straightforward, simple, and not too restrictive basis for approval of curricula in accredited forestry schools which will qualify graduates of such curricula to Junior Membership immediately upon graduation and nothing more.

The second major change approved by the Council on November 17, 1952 involves the addition of a third Affiliate Membership grade, which would make eligible to membership immediately upon graduation students in accredited forestry school curricula that do not include the minimum 3 quarter-credit course in each of the five fields: silviculture, forest management, forest protection, forest economics, and wood utilization. The description and requirements for this new membership grade in Bylaw 4 are as follows:

"Affiliate Class C. Graduates of institutions which have been accredited by the Council of the Society, who have majored in wood utilization or technology, wildlife management, or range management, where these curricula do not include all the five professional courses (silviculture, management, protection, economics, and utilization) shall be eligible for election to Affiliate Grade C."

This change provides a place in the Society for all except a few graduates of very specialized curricula of accredited schools of forestry. Their advancement to Junior Membership will be provided for in the same manner as for Class B Affiliate Members.

At its November 17 meeting the Council approved several minor changes in Bylaw 3 (Accredited Schools), Bylaw 19 (Membership Endorsement), and wording changes in Bylaws 11, 12, 13, 17, and 18 which will clarify the bylaws and simplify the nomination and election procedure.

Several changes in the sections of the Constitution relating to membership were likewise approved by the Council on November 17. These recommended changes in our Constitution will be submitted to the membership for consideration.

C. OTTO LINDH,
D. B. DEMERITT,
F. H. KAUFERT, *Chairman.*

Report of Committee on Accrediting

This constitutes the annual report of the Committee on Accrediting Schools of Forestry. During the period since the last annual meeting, the Committee has had under consideration items pertaining to the accredited status of a few institutions. These confidential items are already known to the members of the Council.

In addition, the Committee has revised the "Bases for Accrediting." The revisions consisted largely of making the statements conform to what was actually done in the accrediting procedures of 1950. The net result is less emphasis on the quantitative elements of accrediting and greater emphasis on the qualitative. The Council approved this revision at its midsummer meeting of 1952. The revised edition of "Bases for Accrediting" was mimeographed and mailed to members of the Council, members of the Accrediting Committee, and the heads of all forestry schools in the United States.

The Committee has followed with interest the activities of the National Commission on Accrediting. This Commission is made up of the executives of many institutions of higher learning in the United States and represents in its membership colleges and universities supported by endowments as well as those supported by municipal and state funds. The purpose of the Commission is to remove or alleviate those elements of accrediting practice which appear to its members as constituting encroachments on the prerogatives of the executives of institutions of higher learning.

Your Committee on Accrediting has on a number of occasions recommended to the executive secretary that we offer our cooperation to the Commission in furthering stronger professional training. While the members of the Committee on Accrediting view with some misgivings the apparent present plan of the Commission for accrediting by large teams, representing all the affected accrediting agencies, we approve of the offer made by Mr. Clepper to give the plan a trial.

The Committee on Accrediting feels it would be remiss in its duties if it did not recommend to the Council that some discussion be given soon to the course of action which the Society should take if we find ourselves unable to agree with other members of a large accrediting team as to the status of forestry in a given institution. For example, it is altogether possible that an institution might prove worthy of approval by a regional accrediting agency so far as general education is concerned and by several professional accrediting agencies for their respective professions, but still be unworthy of approval as to its forestry curriculum. The implication of information so far released by the National Commission is that once an institution is approved by a majority of the Joint Accrediting Committee, all curricula are automatically blanketed in. The first trial of the proposed plan at which forestry is represented will, of course, provide a better basis for future action.

The Committee on Accrediting has noted that it is charged by the Council with the responsibility of conferring with the heads of the professional societies in range management and wildlife management as to possible future joint accrediting. No steps have as yet been taken but correspondence will be instituted shortly. Any developments will be reported to the Council prior to the summer meeting of 1953.

MYRON KRUEGER, *Chairman.*

Report of Committee on International Relations

The only pending question in which your Committee was concerned at the time of its last annual report was the proposal that the United States offer to be host to the Fourth World Forestry Congress. On the basis of information gathered in 1951, the Committee had informed the Council that it did not believe conditions were propitious for advancing an invitation to hold the Fourth World Forestry Congress in the United States. In addition, Society members who were delegates to the 1951 annual conference

of FAO late in 1951 had been asked to explore the matter further. Upon the return of these delegates to the United States, a conference of all agencies which would be concerned in a World Forestry Congress was held, and was attended by the president and executive secretary of the Society, as well as the chairman of the Committee on International Relations. The Society's position at the meeting was against extending the invitation under present conditions, and this was the position adopted as the decision of the meeting.

In early summer, President Drake wrote to the Latin American regional office of FAO, urging that the Forestry School of the University of the Andes, Venezeula, be given careful consideration as the site of the Latin American Center for Forestry Training. This step was taken because of the outstanding position of the school in Latin America from the standpoint of both faculty and equipment. Marshall Turner, a member of the Society and a graduate of the Yale School of Forestry, is director of the school, and the faculty includes men with exceptionally useful background. It is good to be able to report that at its meeting in June 1952, the Latin American Forestry Commission voted to establish the training center at the University of the Andes, thus creating the first international school in Latin America for students of forestry.

During the past year the chairman has had opportunities to bring to the attention of various U. S. agencies the need for foresters in their international cooperation programs, as well as the importance of including forestry in land use programs. There is a possibility that some new forestry positions abroad may be created as a result of these efforts, specifically the appointment of forestry attaches for regions where forestry can be most important, and it has already been possible to place several foresters in positions with programs already set up. Several U. S. agencies have adopted the practice of taking advantage of the Committee's knowledge of foresters available and particularly qualified for foreign duty, and the agencies have been supplied with this information.

The Committee has taken up with officials of the U. S. State Department and the U. S. Forest Service a proposal to bring approximately a dozen Latin American forestry educators to this country in order to acquaint them with U. S. methods of forest instruction and experimentation, watershed control, silviculture, and logging. Both the State Department and the Forest Service have signified their interest in this program, and further steps will be taken toward working out the details. Tentatively, it is proposed that the group would spend at least two days at Asheville, examining hardwood silviculture and watershed management. They would then visit at least four forestry schools, the Forest Products Laboratory, and one range experiment station, and would make an examination of logging somewhere on the Pacific Coast. It is felt that such a study of forestry school curricula, use of equipment, and so forth, would help greatly to orient and improve the quality of forestry instruction now existing in Latin America, and would strengthen the hand of the educators themselves in dealing with their respective governments and obtaining greater recognition and more adequate budgets. Tentatively, a visit of two months' duration is suggested, and the probable time April and May 1953. The Council of Forestry School Executives has been asked to suggest the names of schools which would be most advantageous for the Latin Americans to visit.

During the year the Committee has put its facilities to the service of foreign foresters visiting the United States, as well as to Society members going abroad. It has received gratifying cooperation from United States Government agencies in arranging itineraries and appointments for visiting foresters.

The Committee proposed only one Corresponding Member since the last meeting, but submitted two names to the Council for election as Honorary Members.

In this connection, the Committee recommends to the Council that the JOURNAL OF FORESTRY should be sent without cost to all Honorary Members. This will not entail a large number of copies and will be of special benefit to foreign Honorary Members in enabling them to receive our JOURNAL without the need of purchasing drafts.

The only large international meeting of interest to SAF members in 1952 was the Sixth International Grasslands Congress, held at Pennsylvania State College, August 17-23. This meeting was the first of the Grasslands Congresses to be held in the U. S., and W. R. Chapline was executive secretary of the Congress's Organizing Committee.

Another meeting of interest to many members was the Sixth British Commonwealth Forestry Conference, held in Canada from August 30th to September 13th following a field tour of approximately two weeks in the Dominion. Two Honorary Members of the Society of American Foresters participated in the Conference, Prof. H. G. Champion, and the late Lord Robinson, whose sudden death while the conference was in progress was the only sad note in a conference which was, from all reports, highly successful. Lord Robinson had served as vice president of the conference, and J. D. B. Harrison was its secretary. Other Society members who participated were J. W. B. Sisam, who served as chairman of an *ad hoc* Committee on Survey of Forest Resources, Lowell Besley, K. B. Brown, G. W. I. Creighton, K. G. Fensom, John Miles Gibson, I. T. Haig, J. A. Hall, V. L. Harper, A. Koroleff, L. J. Markwardt, Edgar Porter, J. L. Van Camp, Chas. A. Wellner, and J. O. Wilson.

To date, the only international meeting of interest to foresters that has been definitely scheduled for 1953 is the Third Pacific Science Congress, which will be convened in Manila, P.I., November 16, and will hold sessions through November 28. The Congress has a subcommittee on forestry which has been actively directed by Stephen T. Wyckoff.

As soon as definite information is received concerning the date and place of the next world forestry congress, as well as other international meetings of interest to the members, it will be passed on to the membership through a note in the JOURNAL OF FORESTRY.

The year's accessions have included a bound volume of all the reports on Japanese natural resources prepared under the direction of the Natural Resources Division, SCAP, during the occupation of Japan, as well as all forestry reports of the Food and Agriculture Organization, issues of the Empire Forestry Review, and of the *Filipino Forester* (Journal of the Society of Filipino Foresters).

As in the past the Chairman has served as the Society's representative on the U.S.-FAO Interagency Committee.

E. C. CRAFTS,
I. T. HAIG,
LEROY HUNTINGTON,
BARRINGTON MOORE,
LYALL E. PETERSON,
J. W. B. SISAM,
J. H. STOECKELER,
TOM GILL, *Chairman.*

Report of Committee on Manpower

In June 1951 President Evans appointed a Committee on Manpower. Its purpose is to keep the Council in close touch with the current and potential situation respecting technical manpower requirements so that it would be in a better position to act promptly should the occasion develop during the emergency period.

During the past year this committee has carried out its functions as follows: Maintained close liaison with the numerous agencies issuing rulings affecting technical manpower; gained recognition of the interests of our Society in manpower considerations from responsible officials in these agencies; secured clearance for the Society to furnish supply and demand information on the profession of forestry to the Defense Manpower Administration for inclusion in future editions of its report on resources and requirements of specialized personnel; secured cooperation of other professional groups related to forestry concerning mutual manpower problems; and informed interested members of the Society and of industry of developments.

However, the technical manpower situation in the nation, while serious in certain limited areas, has not become as acute as earlier predictions indicated. The supply of technical foresters available has so far been sufficient to meet the needs of the military and defense expansion without working undue hardship upon the activities normally utilizing our professional personnel.

Problems relating directly to the nation's intellectual resources have proven of such magnitude, however, that a number of agencies are now gathering and analyzing detailed manpower information. One of these, the Commission on Human Resources and Advanced Training working under the auspices of the Conference Board of Associated Research Councils, will soon publish a summary of its two-year study of supply and demand characteristics with respect to college and professional personnel. This commission will continue its activities under a Rockefeller Foundation grant until the fall of 1954.

Due to the above conditions, it is recommended that the S.A.F. Manpower Committee be continued only on a standby basis, ready to resume an active role in professional manpower problems, should future events indicate the need thereof. It is believed that our Society's executive secretary could readily serve as "watchdog" to inform the Committee of an impending need for action.

JOHN F. SHANKLIN,
PAUL SCHOEN,
FRED H. MILLER,
GEORGE W. DEAN
HENRY BAHR,
HARDY L. SHIRLEY, *Chairman.*

Report of the Committee on Safety

Our first assignment, to formulate a policy statement on safety for the Society, was completed on May 9, 1952, at which time it was forwarded to the Council for consideration.

The Council unanimously approved a four-point safety policy in June. This included active participation of foresters in accident prevention, and indoctrination of forestry students in safety principles. Not approved was the Committee's recommendation that foresters urge "that management give the necessary impetus to the adoption of safe methods and practices," and to endorse the management approach to accident prevention.

We hope that the Council will reconsider this recommendation because it is felt that full management support is the key factor to success in any safety program.

With the exception of the omission of management support, the Committee feels that the Society has a solid foundation upon which to build sound accident prevention among its members.

The second phase of the Committee's activities started in September when we began implementing the policy statement. Mr. Clepper circularized all forestry schools to determine what has been done on safety in the schools, and to see if they wanted help. The 32 replies have been analyzed by the Committee chairman. Much has already been done, and the questionnaire has stimulated a renewed interest. Replies were preponderantly in favor of the Society helping out. This will be another committee assignment, no doubt.

The Committee plans no immediate activity towards stimulating active participation of foresters in the safety movement until it hears about the Council's action on the management recommendations. If it is approved, the Committee can then go ahead with a well rounded program. This will probably be handled by subcommittees in order to distribute the job load and expedite the work.

SETH JACKSON, *Chairman.*

Report of Committee on Community Forests

The Committee on Community Forests was circularized by the chairman last April asking for suggestions on ways of activating the program proposed in the committee's report for 1951. Constructive responses were received from the following committee members: Nelson C. Brown, Charles G. Geltz, E. V. Jotter, William A. Sylvester, and Harris A. Reynolds.

A memorandum was prepared for consideration by the Board of Directors of the American Forestry Association proposing the Association assume leadership in a nation-wide community forest activity. The Board authorized such an activity.

The first step is to obtain an up-to-date census of existing community forests. To this end the state forestry agencies have been requested to supply statistics on the number, size, and ownership of the present forests. Responses to these requests indicate that the revised census may be expected about the first of 1953. These data will be tabulated by states, and will be made available to any agency which may desire to use them. They will supply statistical information essential to sustained publicity for promotion of the community forest movement. Periodical correction of the census will be necessary.

The next step will be to organize continual publicity in national and local publications and the stimulation of educational programs by national and local organizations and by professional foresters in order to keep the subject before the public to sustain its interest. To accomplish this objective the activity must have the support of foresters everywhere. This support should take the form of reports to the American Forestry Association of case histories and stories of human interest nature about the accomplishments in existing forests which will serve as grist for the publicity mill.

Finally we want to again urge, as did the report of this committee last year, "Each section of the Society to set up a continuing project by appointing responsible and active committees . . . to promote and assist in the establishment of new community forests in localities where they have contacts and also to bring influence to bear upon the state foresters, in their respective areas, to exercise their leadership" in the community forest movement.

This report has not, through lack of time, been submitted to the members

of your committee for prior approval. However, copies are going out to each member with a request that each send to you his comments and any additional contributions to the activity, to be published in the JOURNAL OF FORESTRY along with this report.

GEORGE A. DUTHIE, *Chairman.*

Report of Committee on Library of Congress Photographic Collection

The collection of photographs of foresters in the Library of Congress, known as the Pinchot collection, is in good shape. It is well arranged and well catalogued. However, the growth is slow—discouragingly slow—and the fault is primarily due to the apathy of the foresters themselves. The consensus of the reports from the Section Committee chairman indicates that they simply cannot pry the photos loose from the members of S.A.F.

The importance of the collection cannot be stressed too highly. It is one of several collections of members of the profession and is located in the Prints and Photographs Division of the Library which has a constant stream of visitors seeking pictures with which to illustrate books and articles. And, inquiries are increasing every day.

I think that one reason for the lack of cooperation from the foresters is personal modesty. The feeling is (and it may be natural) that the collection is a sort of honor roll. But the collection is not an honor roll. Reputation and prominence have nothing to do with it. We simply want a photograph of every forester—a complete collection—so that in case a picture is required for any reason whatsoever we can furnish it.

So, Members, give us a hand and send in your photo and a short biography if you haven't already done so.

HELMUTH BAY, *Chairman.*

Report of the Committee on Civil Service

Last year the report of the Committee on Civil Service pointed out that "a preponderant number of our professional schools urge the return to a subject matter test, if not in place of at least combined with or supplemented to, an objective test."

This position, which was supported by the Forest Service and the Department of Agriculture Board of Examiners, has now been realized. The Civil Service Commission has announced that competitors for the forthcoming Junior Agricultural Assistant, forester option, will be required to take a test of technical subject matter, in addition to the general test required of competitors for all options.

This forestry subject matter test will consist of 50 questions. For all forestry applicants—i.e. for both forest and range options—40 of the questions will be the same. Those who apply for the forest option will take 10 additional questions dealing with forestry subjects and those applying for the range option will take 10 additional, but different, questions dealing with range management. Those applicants eligible for both forest and range options will have to answer both the forestry and range management questions of a total of 60 subject matter questions.

We have been advised that the use of academic-type questions which were largely used in previous years will not be used. The questions to be used this year are more of a problem type to test an applicant's general knowledge of forestry and how to apply such knowledge to practical situations.

The Committee on Civil Service recommends that the Civil Service examination be offered in the early spring. It is to be realized, however, that the forester option is just a supplement to the overall agricultural examination offered by the Civil Service Commission. The Land Grant Colleges have a committee known as the Department of Agriculture Committee on Training for Government Service, and it is our understanding that any change in the scheduled date of the examination requires the approval of this committee.

It was not feasible to submit a request for a change in date this year, but the possibility of moving the examination to the spring will be explored, provided professional questions will continue to be used in future examinations.

D. S. JEFFERS,
E. R. MARTELL,
W. C. PERCIVAL,
D. J. WEDDELL,
M. K. GODDARD, *Chairman.*

A Resolution

The Society of American Foresters in joint annual meeting at Montreal, Canada, with the Canadian Institute of Forestry, November 17-20, 1952 acknowledges with gratitude the valuable publicity in the press and on the radio relating to the recent forest fire emergency.

This excellent public service contributed materially, both directly and indirectly, to a better public appreciation of the value of America's forests. Many of the fires were not mere brush fires, but destroyed large trees of immediate use value.

Therefore, it is resolved that the Society of American Foresters commends and expresses its appreciation to the members of the press associations and the National Association of Radio and Television Broadcasters for their contributions to forest conservation by keeping the American people informed of the seriousness of the forest fire situation all during the emergency period.

It is further resolved that the executive secretary, S.A.F. transmit this resolution to the main offices of the above associations and that copies also be released to press representatives at the conclusion of this meeting.

It is further resolved that this resolution also be sent to the Federal Communications Commission, Washington, D. C.

Report of Council Meeting

A meeting of the S.A.F. Council was held November 17, 1952 in the Mount Royal Hotel, Montreal.

Present were President George L. Drake, Vice President E. L. Demmon, William J. Brown, D. B. Demeritt, Frank H. Kaufert, C. Otto Lindh, G. D. Marckworth, Richard E. McArdle, P. A. Thompson, R. H. Westveld, and Henry Clepper, executive secretary. Earl Porter was unavoidably absent.

Policy on Legislation

The following policy statement on legislation, adopted by the Council on June 20, 1950, was reviewed:

Inasmuch as the officers of the Society may be called upon to express the viewpoint of the Society on legislative matters affecting the general forestry interest, either when a referendum has been held by the Society relative to the matter in question, or when no such referendum has been held, the Council adopted the following policy to guide the action of the Society officers.

1. The Society officers shall not be permitted to lobby or to be registered as lobbyists.

2. In the event referenda on legislative matters are held by the Society, the executive secretary shall forward to the appropriate agencies and officials the results of the referenda.

3. On invitation, the executive secretary and other officers may appear

before legislative committees to represent the Society.

President Drake appointed a Council committee (Demeritt, McArdle, and Thompson) to suggest desirable changes. On motion of Mr. Lindh, seconded by Mr. Demeritt, the following revised policy was unanimously approved.

As a professional society the Society of American Foresters has an obligation and responsibility to maintain a vigorous and positive interest in legislative matters pertaining to forestry.

The officers should be prepared to offer assistance and counsel on legislative matters pertaining to forestry and should endeavor to make the professional views of the Society known and in other ways be of assistance.

It is understood that its officers shall not be permitted to lobby or register as lobbyists but may, upon request, appear before legislative committees to represent the Society.

In carrying out these duties the officers shall be guided by referenda which the Society may have held, or by instructions from the Council.

Amendments of Constitution and Bylaws

As the culmination of more than two years of study by the Council, aided by membership-opinion polls taken in a number of the Sections and chapters during 1952, the Council proposed certain revisions of the Constitution and Bylaws governing admission to the Junior Member and Affiliate Member grades.

In addition, amendments found necessary with respect to current procedure in the publication of the JOURNAL OF FORESTRY and the appointment of the editor are proposed.

Other amendments, both to the Constitution and Bylaws, bring Society procedure up to date with respect to the Council's authority to approve curricula as well as accredit colleges and universities for professional forestry instruction.

The proposed revisions of the Constitution and Bylaws are published immediately following this report of the Council. These amendments were unanimously approved by the Council on motion of Mr. Demmon, seconded by Mr. Brown.

Finances

Table 1 shows the auditor's report of income and expenses for 1952, together with the proposed budget for the fiscal year 1953. This budget was unanimously approved by the Council on motion by Mr. Demeritt, seconded by Prof. Marckworth.

On motion by Dr. Kaufert, seconded by Prof. Marckworth, the Council unanimously approved the appropriation of $1,000 from the general investment fund for completion of *The Foresters' Manual*. To date, this project has involved expenses of $7,000.

TABLE 1.—A COMPARISON OF EXPENSE AND INCOME FOR 1951 AND 1952, AND THE BUDGET FOR 1953

Item	1951	1952	Budget 1953
EXPENSE			
Journal of Forestry	$ 30,853.51	$ 36,701.94	$ 37,500.00
Editor's Expense	11.52	355.79	250.00
Salaries, Exec. Sec'y & Asst.	13,800.00	11,458.38	9,400.00
Salaries, Editorial	3,750.00	5,764.62	9,900.00
Salaries, Office	23,646.00	26,609.98	29,870.00
Advertising Retainer & Commission	6,315.38	7,289.59	7,750.00
Advertising Promotion	983.39	1,863.86	1,500.00
Travel, Officers	2,923.58	2,726.12	3,000.00
Postage	1,684.97	1,754.49	1,900.00
Telephone and Telegraph	469.08	458.63	675.00
Rent	2,870.00	3,528.00	3,528.00
Multigraph and Mimeograph	314.00	564.10	500.00
Miscellaneous Printing	836.15	732.15	750.00
Office Supplies	729.80	710.32	1,000.00
General Expense	897.63	1,390.59	1,000.00
Depreciation	410.19	528.84	500.00
Pension Plan	747.14	672.75	615.00
Natural Resources Council	200.00	100.00	100.00
Committee Expense	61.65	36.06	100.00
Grading Forestry Schools	52.96	56.61	100.00
Council Travel Expense	1,526.74	932.12	1,500.00
Referenda and Election of Officers	386.70		500.00
Division Expense	70.78	49.21	75.00
American Inst. of Biol. Sciences	50.00	100.00	50.00
Social Security Tax	491.56	524.47	600.00
Miscellaneous	585.05	56.98	75.00
Annual Meeting	232.06	55.40	
Section Manual and Student Material	462.27	415.89	100.00
Total	$ 95,402.11	$105,436.89	$112,838.00
INCOME			
Dues	$ 73,028.81	$ 78,425.53	$ 83,000.00
Fees	3,530.75	2,283.25	2,100.00
Subscriptions and Sale of Journals	7,464.51	7,115.12	8,000.00
Advertising	14,049.28	17,824.31	18,800.00
Interest and Dividends	496.19	619.41	500.00
Miscellaneous Income	1,508.58	357.22	600.00
Total	$100,078.12	$106,624.84	$113,000.00
Estimated net earnings	$ 4,676.01	$ 1,187.95	$ 162.00

President Drake was authorized to appoint a small committee to study the existing pension plan for Society employees and to make recommendations to the Council before its mid-year meeting in 1953. The committee consists of Sam R. Broadbent, Miss L. A. Warren, and President Drake, *ex officio*.

The need for additional income to enable the Society to carry forward current and proposed activities in the interest of the profession was discussed at length. On motion by Dr. McArdle, seconded by Dr. Westveld, the Council unanimously authorized President Drake to appoint a committee of the Council to study the cost of operation of the Society in relation to dues, and to carry forward a program to inform the membership of the cost of Society operation and the need for increased income. The committee consists of E. L. Demmon, chairman; W. J. Brown, and R. H. Westveld.

Lloyd Thorpe, Seattle, Wash., advertising representative for the JOURNAL OF FORESTRY, outlined to the Council the development of advertising and his plans to promote increased income from this source. The Council thanked Mr. Thorpe for his past efforts and continued the arrangement under which he operates as the JOURNAL's advertising representative. On the recommendation of Mr. Thorpe and Miss L. A. Warren, business manager, JOURNAL advertising rates will be raised during 1953.

The Foresters' Manual

R. D. Forbes, editor of *The Foresters' Manual*, and Mr. Clepper reported to the Council on publication possibilities. It is expected that the

manual will be completed and ready for delivery to the publisher in January. Three publishing houses have been interviewed and each has expressed an interest in publishing the book. The three firms are McGraw-Hill Book Company, Inc., The Ronald Press Company, and John Wiley & Sons, Inc.

On motion by Mr. Demmon, seconded by Dr. McArdle, President Drake was instructed to appoint a committee consisting of one Council member, Mr. Clepper, and Mr. Forbes, with authority to make the decision as to the publisher and enter into contractual relations. D. B. Demeritt was designated as the Council member to serve on this committee.

The Foresters' Manual will comprise a book of approximately 750 pages and should be available for distribution late in 1953.

Committee Appointments

President Drake announced the appointment of Dr. W. C. McCulloch of Oregon State College to the Society's Committee on Accrediting, to serve in place of Dean Paul M. Dunn who is in Chile on an F.A.O. assignment.

He also announced the appointment of John D. Coffman of California to serve on the Committee on Policies and Objectives.

On motion by Mr. Brown, seconded by Mr. Demeritt, the Council authorized the president to appoint a nominating committee for the regular biennial election of 1953. The following members have been asked to serve on this committee: Chairman, H. B. Shepard, Mass.; J. Nelson Spaeth. Ill.; James D. Curtis, Idaho; Bruce Stewart, Texas; and John B. Woods, Jr., Oregon.

President Drake also appointed a special committee, authorized by the Council at its midyear meeting in June 1952, to review all Section bylaws and to make recommendations to provide uniformity in the conduct of Section business procedure, especially as regards the election of officers, membership activities, the administration of chapters, the defining of section boundaries, and similar matters. Requested to serve on this committee are the following members: Chairman, George R. Phillips, former chairman of the Washington Section; Theodore H. Davis, former chairman of the Appalachian Section; W. Harold Horning, former vice chairman of the Columbia River Section; Bert R. Lexen, former chairman of the Central Rocky Mountain Section; and Roland Rotty, former chairman of the Southwestern Section.

Honorary Member Elected

On the nomination by the Committee on International Relations (Tom Gill, chairman), the Council unanimously elected H. R. Blanford of England as an Honorary Member of the Society. Mr. Blanford for many years had been secretary of the Empire Forestry Association and editor of the Empire Forestry Review.

His election to Honorary Membership was in recognition of his interest in promoting better understanding between American and British foresters, and his services in promoting increased knowledge about forestry among English-speaking foresters everywhere.

Proposed Journal of Forest Science

Dr. S. H. Spurr of the University of Michigan was invited to appear before the Council and explain his project for a journal of forest science.

This scientific publication, as proposed by Dr. Spurr and others, would be a quarterly periodical not in competition with the JOURNAL OF FORESTRY.

The Council deferred action on the proposal pending their further study of a progress report submitted by Dr. Spurr.

Changes in Editorial Staff

Several changes in the JOURNAL'S staff of associate editors are effective January 1.

Dr. Ralph W. Marquis, director of the Forest Service's Northeastern Forest Experiment Station at Upper Darby, Pa., has been appointed by President George L. Drake to serve as associate editor for forest economics and policy. He replaces Dr. Robert K. Winters who has taken a position in Pakistan with the State Department. Dr. Winters, who was formerly with the Central States Forest Experiment Station in Columbus, Ohio, had been associate editor since June 1952.

Dr. Marquis is an outstanding forest economist, a member of the American Economic Association, and author of *Economics of Private Forestry*. An Associate Member of the Society of American Foresters since 1943, he served as a member of the Division of Forest Economics and Policy executive committee in 1946-1947, as secretary in 1949 and as chairman in 1950; in addition he was a member of the commission on effect of income taxes on forestry in 1949-1950. Dr. Marquis received the Ph.D. degree in 1931 from the University of Wisconsin where he taught until 1940, when he entered government service.

Dr. Harvey J. MacAloney, entomologist-in-charge of the Agricultural Research Administration's Forest Insect Laboratory in Milwaukee, replaces Dr. George H. Hepting as editor for forest pathology and entomology. Dr. Hepting, who served in this capacity for nearly three years, resigned because of increased pressure of his duties as principal pathologist with the Bureau of Plant Industry, Soils and Agricultural Engineering in Asheville, N. C.

Dr. MacAloney was in charge of forest insect investigations at the Northeastern Forest Experiment Station from 1925, when he received the degree of Master of Forestry from the New York College of Forestry, until 1929, when he joined the Forest Insect Laboratory. He received his Ph.D. from the New York College of Forestry in 1929. He served on the Society's committee on meetings in 1937 and 1948, as secretary the New England Section from 1931 through 1935, and as Section chairman from 1936 through 1937.

In addition to these two changes in associate editors, it has been decided to eliminate the assignment of associate editor for *World Forestry*. J. W. B. Sisam, dean of the Faculty of Forestry, University of Toronto has been serving in this capacity since the creation of this assignment in 1946. At that time a need was apparent for an associate editor with a world forestry background to review the large number of papers from foresters who, through military or other foreign service, had observed forest conditions and activities in other countries. Dean Sisam had at that time recently completed six years as director of the Imperial Forestory Bureau, Oxford, England, and was admirably suited to the task. However, in recent months the volume of material in this category has markedly dropped off, and at the suggestion of Dean Sisam this particular assignment is being discontinued.

Proposed Amendments to the Constitution and Bylaws

The following proposed amendments are submitted for the information of the voting members.

Following this publication, the proposed amendments to the Constitution will be sent to the voting members in the form of a ballot. "The Constitution may be amended by a two-thirds vote of the members voting, provided the proposed amendments have been submitted to all voting members at least four weeks in advance of the date set by the Council for counting ballots. Amendments shall, unless they provide otherwise, be effective immediately upon their adoption."

Amendments to the Bylaws become effective immediately upon adoption unless otherwise specified by the Council. Members at large do not vote on the Bylaws, but since several of the amended Bylaws are directly tied in with proposed amendments to the Constitution, these Bylaws will become effective concurrently with the effective date of the Constitutional amendments, if approved by the necessary two-thirds vote.

ARTICLE III

Affiliate Membership Defined

PRESENT

Section 3. Affiliate Members shall be persons who have had six years or more of practical experience in the production of timber crops or management or protection of the forest resources of forest land, and who have demonstrated their ability in practical forest administration as evidence by employment in positions of responsibility; or persons who are graduates of institutions offering curricula in forestry not accredited by the Council of the Society of American Foresters, but containing the courses basic to professional training. Affiliate Members may be elected to Junior Membership on showing proof of eligibility.

PROPOSED

Section 3. Affiliate Members shall be persons (1) who have had education in forestry but who do not qualify for Junior Membership; or (2) who have had six years or more of practical experience in the production of timber crops or management or protection of the forest resources of forest land, and who have demonstrated their ability in practical forest administration as evidenced by employment in positions of responsibility.

Affiliate Members may be elected to Junior Membership on showing proof of eligibility.

[This proposed amendment is desirable in order to provide for admission to the Society of applicants who have had education in forestry but insufficient for admission to the junior grade. It also provides for admission of applicants with a combination of education and experience; and it continues to make eligible those who qualify on the basis of experience alone.]

BYLAW 3

Accredited Schools

PRESENT

3. In pursuance of Article III, Section 4, of the Constitution, the Council shall list the institutions teaching professional forestry in three classes:

a. Institutions approved by the Council. These shall be termed "Approved Schools."

b. Institutions listed by the Council as covering in their instruction the general field of professional forestry but not approved by reason of not meeting fully the standards required for such approval. These shall be termed "listed Schools."

c. Institutions which do not provide adequately for covering in their instruction the general field of professional forestry by reason of inadequate teaching force, or incomplete curriculum or both.

PROPOSED

In pursuance of Article III, Section 4 of the Constitution, the Council shall designate as accredited institutions those colleges and universities offering professional forestry instruction that meet the standards of adequacy established by the Council as to curricula, faculty personnel, and related facilities.

For the purpose of determining the eligibility of graduates of accredited institutions for Junior Membership, the Council shall additionally designate as approved those curricula that contain all the minimum professional courses specified in Bylaw 5.

[This proposed amendment specifically authorizes the Council to approve curricula as well as accredit schools. See proposed amendment of Article III, Section 4.]

BYLAW 4

Affiliate Membership

PRESENT

Requirements for Affiliate Grade: Practical training in forestry, or in related fields in wildlife management or forest utilization, but of insufficient quality or quantity to meet the requirements of the Junior Member grade, is the basic requirement.

Class A. Graduates of institutions which offer forestry curricula, but which have not been accredited by the Council of the Society of American Foresters, shall be eligible for election to the Affiliate grade provided their instruction has included the following professional courses: Silviculture—3 semester units (based on ecology—3 semester units; botany, plant physiology, and dendrology—6 semester units, and soils—3 semester units); Protection (fire, insects, or disease)—3 semester units; Management—3 semester units (based on mensuration—3 semester units, surveying—3 semester units, and mathematics through trigonometry); Economics—3 semester units (based on general economics—3 semester units); and Utilization—3 semester units.

PROPOSED

Requirements for Affiliate grade: Training in forestry, or in related fields in wildland management or forest utilization, but of insufficient quantity to meet the requirements of the Junior Member grade, is the basic requirement.

Class A. Graduates of institutions which offer forestry curricula, but which have not been accredited by the Council of the Society, shall be eligible provided their instruction has included not less than one 3 quarter-credit course in each of the following subjects; silviculture, forest management, forest protection, forest economics, and wood utilization.

Class B. (No change.) Persons who have had at least six years of practical training, or a combination of practical and theoretical training equalling at least six years, shall be eligible. Each academic term of appropriate theoretical training at ranger, vocational, or professional forestry schools may be substituted for one year of practical training up to a maximum of two years.

ARTICLE III

Junior Membership Defined

PRESENT

Section 4. Junior Members shall be graduates of a school of forestry approved by the Council; or in lieu of such training they shall show proof that they have acquired an adequate understanding of the basic economic, business and technical facts and principles sufficient for the foundation of a professional career in forestry and substantially equivalent to the training given in a school of forestry approved by the Council. The Council shall determine the form and method by which such proof shall be shown, including the equivalents in practical experience and in school training, which will be accepted as qualifying the candidate for election to this grade of membership.

PROPOSED

Section 4. Junior Members shall be graduates of curricula approved by the Council in institutions accredited by the Council; or in lieu of such training they shall show proof that they have acquired a combination of technical experience and education sufficient for a professional career in forestry and equivalent to the training given in an approved curriculum in an institution accredited by the Council.

[This proposed amendment specifically provides that Junior Members, who qualify solely on the basis of education, shall be graduates in approved curricula of accredited schools. See proposed amendment of Bylaw 3.]

ARTICLE IV

Admission to Membership

PRESENT

Section 1. All admissions or reinstatements to the Society, and advancement from the grades of Affiliate or Junior Member to a higher grade shall be by vote of the Council.

For candidates for reinstatement and for Junior Membership who are graduates of schools of forestry approved by the Council, and for candidates for Student Membership who qualify for this grade as defined in Article III, said Council may delegate this authority to the Executive Secretary.

For all other candidates, the Council may delegate this authority to a Council committee of three appointed by the President. The unanimous vote of this Council committee shall be required to elect a candidate; a split vote by the committee shall require consideration by the whole Council. When the whole Council acts on a doubtful case or one rejected by the Council committee, eight affirmative votes shall be necessary to elect.

At least one month prior to action by the Council, the names of all candidates proposed, with a statement of their qualifications, shall be referred to the entire voting membership for comment or protest.

PROPOSED

Section 1. All admissions to membership, reinstatements, and advancement from the grades of Student Member, Affiliate Member, or Junior Member to a higher grade shall be by vote of the Council.

The Council may delegate this authority to the Executive Secretary in the case of applicants for reinstatement, for Student Membership, for Junior Membership who are graduates of approved curricula in accredited schools, for Affiliate Membership who qualify wholly on the basis of education, and for automatic advancement from Junior Membership to the Member grade.

For all other applicants, the Council may delegate this authority to a Council Committee of three appointed by the President. The unanimous vote of this Council committee shall be required to elect an applicant; a split vote by the committee shall require consideration by the whole Council. When the whole Council acts on a doubtful case or one rejected by the Council committee, eight affirmative votes shall be necessary to elect.

At least one month prior to action by the Council, the names of all applicants with a statement of their qualifications,

Class B. Persons who have had at least six years of practical training, or a combination of practical and theoretical training equalling at least six years, shall be eligible for election to the Affiliate grade. Each academic term at ranger, vocational, or professional forestry schools may be substituted for one year of practical training up to a maximum of two years. Qualifying forestry experience, which may be considered as meeting the practical training requirement, shall be obtained while the candidate is regularly engaged in growing forests, with attendant duties such as management or protection of forest areas, supervision of silvicultural requirements in logging, erosion control, or similar forestry activities; regularly engaged in related wildland activities such as range, wildlife, or recreation management; or regularly engaged in those phases of utilization having a relation to the growing of forest crops.

Qualifying forestry experience, which may be considered as meeting the practical training requirements, shall be obtained while the applicant is regularly engaged in growing forests, with attendant duties such as management or protection of forest areas, supervision of silvicultural requirements in logging, erosion control, or similar forestry activities; regularly engaged in related wildland activities such as range, wildlife, or recreation management; or regularly engaged in those phases of utilization having a relation to the growing of forest crops.

Class C. Graduates of institutions which have been accredited by the Council of the Society, who have majored in wood utilization, wood technology, wildlife management, or range management where these curricula do not include all the five professional courses (silviculture, forest management, forest protection, forest economics, and wood utilization or technology) shall be eligible.

[This amendment is related directly to the proposed amendment of Article III, Section 3, which defines the Affiliate grade. The new Bylaw sets up a third qualification for admission to Affiliate Membership in accordance with the opinions expressed by a substantial majority of the Sections and Chapters which held opinion polls on membership qualifications during 1952. In short, the new Bylaw provides for entrance into the Society, immediately upon graduation from accredited institutions, graduates in certain specified curricula not approved for Junior Membership. Graduates from accredited institutions where these curricula are approved by the Council are still eligible for Junior Membership.]

BYLAW 5

Junior Membership

PRESENT

Requirements for Junior grade: Theoretical training in the fundamental principles of professional forestry is the basic requirement.

Junior membership is the temporary, probational, entrance grade for professionally trained foresters.

Class A. Graduates of approved curricula

PROPOSED

Requirements for Junior grade: Theoretical training in the fundamental principles of professional forestry is the basic requirement.

Junior Membership is the temporary, probational, entrance grade for professionally trained foresters.

Class A. Graduates of approved curricula

shall be referred to the entire voting membership for comment or protest.

[This proposed amendment gives the executive secretary authority, in the Council's discretion, to approve applicants for membership whose qualifications are self-evident and not in doubt. It does not affect the requirement that the Council itself pass on all applications which may be in doubt or which require careful review as to experience qualifications.]

ARTICLE IV

Admission to Membership

PRESENT

Section 2. Nominations for all grades of membership except Junior Member, Student Member, Corresponding Member, Honorary Member, and Fellow shall be endorsed by a Section of the Society except for candidates not residing within the territory of any Section, when they shall be endorsed by three Members or Fellows; and shall be submitted in writing, with complete evidence of qualifications, to the Executive Secretary.

Nominations for Student Membership for candidates who meet the qualifications for this grade shall be endorsed by three voting members of the Society who are on a faculty of the institutions in which the candidates are enrolled.

Nominations for Junior Membership for candidates who are graduates of a school of forestry approved by the Council shall be endorsed by three voting members of the Society or by a Section and shall be submitted with evidence of such graduation to the Executive Secretary.

Nominations for Junior Membership for candidates who are not graduates of a school of forestry approved by the Council shall be endorsed by a Section of the Society and shall be submitted with complete evidence of education and practical experience to the Executive Secretary.

Immediately upon a Junior Member's fulfillment of the requirements for Member, the Section in which he is domiciled may nominate him for the higher grade. A Junior Member who, at the expiration of six years, has not been nominated by a Section for the grade of Member, and who is actively engaged in forestry work, shall

PROPOSED

Section 2. Applications for the following grades of membership may be endorsed by three voting members: Student Membership; Affiliate Membership when applicants qualify on the basis of education; and Junior Membership when applicants are graduates of approved curricula in accredited schools.

Applications for all other grades of membership shall be endorsed by the Sections except for applicants residing outside the territory of a Section in which case they may be endorsed by three Members or Fellows.

Immediately upon a Junior Member's fulfillment of the requirements for Member, he may make application or the Section in which he is domiciled may nominate him for the Member grade. A Junior Member who, at the expiration of six years, has not applied or who has not been nominated by a Section for the Member grade, and who is actively engaged in forestry work, shall automatically become a Member unless his advancement is protested on the basis of lack of competence or for other reasons, and the protest is sustained by the Council.

Annually, the Executive Secretary shall notify each Section of every Junior Member in its territory who is completing his sixth year of membership, and shall request a report on him and an endorsement if he is eligible for Member. Instances of questionable eligibility shall be referred to the Council, which body shall interpret the "actively engaged in forestry work" in doubtful cases. Thus those who have been Junior Members for six years, who are actively engaged in forestry work, shall in institutions accredited by the Council of the Society of American Foresters shall be eligible for election to the Junior Member grade on the endorsement of three voting members. For a curriculum to be approved it must include the following professional courses:

Silviculture—3 semester units (based on ecology—3 semester units: botany, plant physiology, and dendrology—6 semester units; and soils—3 semester units);

Protection (fire, insects, or disease)—3 semester units.

Management—3 semester units (based on mensuration—3 semester units: and mathematics through trigonometry);

Economics—3 semester units (based on general economics—3 semester units); and

Utilization—3 semester units.

Class B. Affiliate Members, who have had two additional years of qualifying forestry experience since being elected to the Affiliate grade, shall be eligible for election to the Junior Member grade on the endorsement of the Section in which the member is domiciled, provided that satisfactory evidence is submitted that during their total experience they have gained a knowledge of all the basic courses which must be included as a minimum in an approved curriculum in an accredited forestry school.

in institutions accredited by the Council of the Society shall be eligible on the endorsement of three voting members.

For a curriculum to be approved it must include not less than one 3 quarter-credit course in each of the following subjects: silviculture, forest management, forest protection, forest economics, and wood utilization.

Class B. Affiliate Members, who have had two additional years of qualifying forestry experience since being elected to the Affiliate grade, shall be eligible for election to the Junior Member grade on the endorsement of the Sections in which they are domiciled, provided that satisfactory evidence is submitted that during their total experience they have gained a knowledge of all the professional courses included as a minimum in an approved curriculum in an accredited forestry school.

[This amendment eliminates the controversial requirement, which was objectionable to some of the schools, that the five basic professional courses must be supported by specifically defined foundation science courses. All the five professional courses are believed to be adequately supported by the necessary preparatory science courses in the accredited schools. But the unit value specification in the old Bylaw 5 was criticized as unduly rigid and restrictive. Therefore, the new Bylaw is a desirable compromise generally acceptable to the schools. It still maintains the minimum requirement that applicants for the Junior Member grade, who qualify on the basis of education alone, shall have pursued studies in all the five basic professional courses, and leaves it up to the schools to determine the kinds of preparatory science courses needed.]

automatically become a Member unless his advancement is protested on the basis of lack of competence or for other reasons, and the protest is sustained by the Council.

Annually, the Executive Secretary shall notify each Section of every Junior Member in its territory who is completing his sixth year of membership, and shall request a report on him and an endorsement if he is eligible for Member. Instances of questionable eligibility shall be referred to the Council, which body shall interpret the phrase "actively engaged in forestry work" in doubtful cases. Thus those who have been Junior Members for six years, who are actively engaged in forestry work, who have had three years' experience in forestry, and whose advancement is not protested on grounds of competence or for other reasons, shall be certified as full Members by the Council.

tively engaged in forestry work, who have had three years' experience in forestry, and whose advancement is not protested on grounds of competence or for other reasons, shall be certified as full Members by the Council.

[This proposed amendment is desirable in that it should be more understandable than the old one. In addition, it brings the Constitution up to date with current procedure and terminology; i.e., by providing for "applications" for membership rather than "nominations," a term no longer used.]

ARTICLE VII

Council

PRESENT

Section 3. The Council shall control the funds of the Society; shall appoint the Editor-in-Chief of the Journal; shall have the power to fill any vacancies occurring in its number; and shall perform such other duties as prescribed in the several articles and sections of the Constitution. The Council shall receive and act upon charges of professional conduct preferred against any member of the Society, as provided in Article IV, Section 5. The Council shall have power, by vote of at least eight of its members, to draft and establish bylaws but no such bylaws shall abrogate or be inconsistent with any part of this Constitution. Any action of the Council may be brought before the Society at large on written petition of not less than 250 voting members representing at least three different Sections with at least 25 members from each. This provision shall not apply to jurisdiction over cases of disciplinary action nor to administrative matters, including the appointment or dismissal of the Executive Secretary, in which cases the decision of the Council shall be final.

Six members of the Council shall constitute a quorum.

PROPOSED

Section 3. The Council shall control the funds of the Society; shall have the power to fill any vacancies occurring in its number; and shall perform such other duties as prescribed in the several articles and sections of the Constitution.

The Council shall receive and act upon charges of unprofessional conduct preferred against any member of the Society, as provided in Article IV, Section 5.

The Council shall have power, by vote of at least eight of its members, to draft and establish bylaws but no such bylaws shall abrogate or be inconsistent with any part of this Constitution.

Any action of the Council may be brought before the Society at large on written petition of not less than 250 voting members representing at least three different Sections with at least 25 members from each. This provision shall not apply to jurisdiction over cases of disciplinary action nor to administrative matters, including the appointment or dismissal of the Executive Secretary and Editor, in which cases the decision of the Council shall be final.

Six members of the Council shall constitute a quorum.

BYLAWS 11, 12, 13, 17, 18, 19

Membership Nomination and Election Procedure

PROPOSED

Throughout these bylaws the words "applicants" should be substituted for "candidates," and "application" for "nomination," to bring our terminology up to date. No further changes are necessary.

For example Bylaw 12 reads, "The Council may elect a candidate to a lower grade of membership than that for which he was nominated, but not to a higher grade, without further publication."

The amended Bylaw 12 would read, "The Council may elect an applicant to a lower grade of membership than that for which he has applied, but not to a higher grade, without further publication."

BYLAW 19

Membership Endorsement

PRESENT

At Council Meeting June 1952:

Every application, except for the specific exemptions listed below, must be supported by three or more sponsor statements from voting members, who from their personal knowledge of the candidate and his work, can provide evidence of his eligibility. Sponsor statements are not required of the following classes of applicants:

1. Applicants for Student Membership.
2. Applicants for Affiliate Membership who are graduates in forestry curricula of schools which have not been accredited.
3. Junior Members eligible for automatic advancement to the Member grade.

PROPOSED

November 17, 1952

Every application, except for the specific exemptions listed below, must be supported by three or more endorsements from voting members, who from their personal knowledge of the applicant and his work, can provide evidence of his eligibility. Endorsements are not required of the following classes of applicants.

1. Applicants for Student Membership.

2. Applicants for Junior Membership who are graduates of approved curricula in accredited institutions.

3. Applicants for Affiliate Membership who qualify wholly on the basis of education.

4. Junior Members eligible for automatic advancement to the Member grade.

[This amendment corrects the one approved in principle in June 1952 in which, through error, item 2 was omitted.]

[This proposed amendment provides for dropping the obsolete office of "Editor-in-Chief of the Journal," and for specifying that the Council shall have complete authority to appoint and dismiss the paid Editor. There are no other changes.]

ARTICLE IX

Society Publications

PRESENT

The Society shall publish serially (1) a technical forestry periodical known as the JOURNAL OF FORESTRY, (2) an official organ with respect to internal matters, and such other publications as the Council may authorize. The official organ known as SOCIETY AFFAIRS, shall be under the immediate editorial supervision of the Executive Secretary, subject to the general direction of the Council, through the President. The Council may, in its discretion, prescribe that it be printed as a supplementary section of the JOURNAL, but with independent editorial responsibility. Publication in SOCIETY AFFAIRS shall constitute reference, distribution, and notice to the membership within the meaning of these terms in Articles IV, VIII, and X of this Constitution.

The JOURNAL OF FORESTRY shall be under the immediate direction of an Editor-in-Chief, who shall be assisted by Associate Editors of such number and fields of duties as may be authorized or prescribed by the Council upon recommendation of the Editor-in-Chief. The Editor-in-Chief shall be primarily and directly responsible to the Council for the editorial policies, contents, and form of the JOURNAL, with final authority over its reading matter within the financial limitations set by the Council, but with full accountability to the Council for judicious and skillful performance. He shall be free from responsibility for the financial and business management of the affairs of the JOURNAL, which shall be lodged with the Executive Secretary under the general direction of the Council, but on occasion shall be consulted in these matters, and he may make to the Executive Secretary or to the Council such advisory suggestions and

PROPOSED

The Society shall publish (1) a monthly technical forestry periodical known as the JOURNAL OF FORESTRY, (2) a monthly official organ with respect to internal Society matters, and (3) such other publications as the Council may authorize.

An Editor of Society publications may be appointed by the Council, at such compensation as the Council may direct, to serve as a staff member of the executive office. He shall perform such editorial and related duties as the Council and the Executive Secretary may assign. The Editor shall be assisted by Associate Editors, appointed by the President, of such numbers and fields of duties as may be authorized by the Council.

The official organ shall be known as Society Affairs. The Council may prescribe that it be printed as a section of the JOURNAL. Publication in Society Affairs shall constitute reference, distribution, and notice to the membership as provided in Articles IV, VIII, and X of the Constitution.

The Executive Secretary may be appointed by the Council to serve as Managing Editor of the Journal for the performance of such duties as the Council may assign him. He shall be responsible to the Council for the business affairs and administrative policies of all Society publications.

[This proposed amendment supersedes the old Article IX which is now out of date with current procedure. It places the paid editor directly under the administrative supervision of the Council, and makes him directly responsible to the Council for the publication of the JOURNAL together with related duties, and assigns responsibility to the executive secretary for the business affairs of Society publications.]

BYLAWS 64, 65, AND 66

Finances

PRESENT

64. A Finance Committee shall be appointed by the President, with the approval of the Council, to advise with the Executive Secretary and with the Council regarding the budget and the handling of the Society's investments. The Finance Committee may also be called upon in an advisory capacity with reference to the renting of office space and in the employment of such clerical and other assistance as may be necessary to carry on the business of the Society, subject to the limitations of the budget.

65. The funds of the Society except those needed for current use shall be deposited in a savings bank approved by the Finance Committee or invested in federal securities. No other class of securities shall be authorized as investments for Society funds. This bylaw shall not be retroactive as ordering the sale of existing securities and reinvestment, except in the discretion of the Finance Committee.

PROPOSED

64. Eliminated.

65. The funds of the Society shall be deposited in a bank, approved by the Council, or invested in federal securities. This bylaw shall not be retroactive as ordering the sale of existing securities and reinvestment.

[These bylaws provide for certain duties by the Finance Committee. Years ago when the Council met only infrequently and when most business matters were handled by correspondence, the Finance Committee was very useful. Now that the Council meets twice a year, and all business matters, including the budget and investments, are reviewed carefully by the Council, the Finance Committee can be dispensed with.

It is proposed that Bylaw 64, which established the Finance Committee, be eliminated entirely; and that references to the Finance Committee, which further define its duties, in Bylaws 65 and 66 be deleted.]

PRESENT

66. A budget showing estimated receipts and expenditures shall be prepared by the Excutive Secretary at the beginning of each year, **in consultation with the Finance Committee.** Upon approval of the budget by the Council, expenditures within the limitations of the budget may be made by the Executive Secretary without further authorization from the Council. Expenditures for any purpose in excess of the amount allotted in the budget, or for purposes not provided for in the budget, shall require special authorization of the Council, except that minor transfers from one appropriation to another may be made without such authorization. The budget may be amended at any time by action of the Council.

PROPOSED

66. A budget showing estimated receipts and expenditures shall be prepared by the Executive Secretary at the beginning of each year. Upon approval of the budget by the Council, expenditures within the limitations of the budget may be made by the Executive Secretary without further authorization from the Council. Expenditures for any purpose in excess of the amount allotted in the budget, or for purposes not provided for in the budget, shall require special authorization of the Council, except that minor transfers from one appropriation to another may be made without such authorization. The budget may be amended at any time by action of the Council.

[Words in boldface in present Bylaw are eliminated.]

representations relating to the business affairs of the JOURNAL as he may deem appropriate. With his approval, the Executive Secretary may be appointed by the Council to serve as Managing Editor of the JOURNAL under the Editor-in-Chief, for the performance of such duties as the Council may assign him within the field of responsibility of the Editor-in-Chief.

The Editor-in-Chief shall be chosen by ballot of the Council at the beginning of each biennium which the Council is elected, and shall serve at the pleasure of the Council or until a successor is elected. Associate Editors shall be appointed by the President upon recommendation of the Editor-in-Chief and serve until the expiration of the biennial period and the appointment of a successor; except that when a new Editor-in-Chief is elected in the midst of a biennial period, the term of the Associate Editors then serving shall be only until successors are appointed. The Associate Editors, the Managing editor if appointed, and the Editor-in-Chief shall comprise the editorial staff of the JOURNAL.

BYLAW 72
Society Publications

PRESENT

The Society's official publication, within the meaning of the Constitution, shall consist of two serial publications of 12 issues each to appear monthly, namely, the JOURNAL OF FORESTRY and Society Affairs. Society Affairs is designated as the official organ or publication of the Society referred to in various sections of the Constitution, and publication in it shall constitute notice to the membership as required in Articles IV, VIII, and X and in the Bylaws. The contents of Society Affairs are not subject to the editorial staff and do not come under the provisions of Article IX of the Constitution. The Editor-in-Chief shall have sole responsibility for the final selection and approval of the contents of the JOURNAL OF FORESTRY, and its form and workmanship. He shall consult the editorial staff before making any important changes in format or cover. In the exercises of these responsibilities he shall be subject to budget limitations and general policies as determined by the Council.

PROPOSED

[It is proposed that this Bylaw be eliminated inasmuch as its provisions are covered by the proposed amendment of Article X, which see.]

Coming Events

Southeastern Section

The winter meeting of the Southeastern Section will be held January 16-17 in the Whitley Hotel, Montgomery, Ala. The theme of the meeting is "Forestry Services for Southern Timber Growers and Processors."

The Section secretary is John C. Mitchell, T.V.A. Forestry Office, Wilson Dam, Ala.

Southern California Section

The January dinner meeting of the Southern California Section will be held on the 16th at Carpenter's Restaurant, Areadia. George L. Drake, president of the Society, will be the speaker for this meeting.

Future monthly meetings of the Section are scheduled for Carpenter's Restaurant at Areadia for February 20, March 20, April 17, and May 15.

Information about programs may be obtained from James O'Keefe, program chairman, 940 Ventura Street, Altadena, Calif.

Central Rocky Mountain Section

The Central Rocky Mountain Section will hold a meeting on January 16 in Colorado Springs. Among other items of business the Section members will discuss plans for the national S.A.F. meeting to be held in Colorado Springs in September 1953.

The Section secretary is Daniel Green, 3020 Newton St., Denver, Colo.

New York Section

The winter meeting of the New York Section will be held at the Hotel Syracuse, Syracuse, N. Y. on January 29-30. The theme of the meeting is "Forest Research in New York State."

The Section's banquet will be held on January 29 with Dr. William S. Carlson, president of the State University of New York, as the speaker.

J. E. Davis, College of Forestry, State University of New York, Syracuse, N. Y., is the Section secretary.

Association of Southern Agricultural Workers

The golden anniversary meeting of the Association of Southern Agricultural Workers will be held in New Orleans, La., February 9-11. Convention headquarters will be the Jung Hotel.

The Forestry Section of the A.S.A.W. will hold its meeting in the Roosevelt Hotel. Information about the forestry

program may be obtained from the secretary of the Forest Section, G. N. Bishop, School of Forestry, University of Georgia, Athens, Ga.

North American Wildlife Conference

The 18th North American Wildlife Conference will be held in the Statler Hotel, Washington, D. C. on March 9-11.

Information about the program may be obtained from the Wildlife Management Institute, Wire Building, Washington 5, D. C.

There will be a meeting of the S.A.F. Division of Forest Wildlife Management in connection with this conference. The Division's secretary is Galen Pike, Box 338, Duluth, Minn.

Intermountain Section

A meeting of the Intermountain Section will be held in Logan, Utah, during the last week in March.

Information about dates and program may be obtained from the secretary, James D. Curtis, U. S. Forest Service, Ogden, Utah.

New England Section's Flood Control Statement

L. W. Rathbun presented the following statement on behalf of the New England Section to the New England-New York Inter-Agency Committee at its public hearing in Concord, N. H., October 9, 1952 on flood control.

"The New England Section, Society of American Foresters, made up of some 500 professional foresters, wishes to urge the New England-New York Inter-Agency Committee to include plans for the encouragement of proper timberland management in any program for control of floods in New England. Forests occupy 77% of the land area of New England, a proportion larger than that in any other region of the United States, and are one of the most important resources of the region. In addition to protecting soils from erosion and promoting a steady flow of water vital to human consumption and to industry, forests supply the raw materials for industries employing over 83,200 people, and support a large and growing recreational business.

"We believe in coordinated planning with respect to all resources and feel that any program for New England should emphasize prudent forest management to encourage the wise use of the forests which are so vital to the security and prosperity of New England's people and industries.

"We urge that the taking of land for flood control purposes be done only after a full analysis has been made of the economic effects it would have on the affected community in relation to forest and agricultural land uses and taxes."

Committee Polls Schools on Safety Training

The following is a text of a letter to all heads of accredited schools offering forestry instruction from the Society's special committee on safety:

The Council of the Society has unanimously adopted the following policy on training in the principles of safety as the result of recommendations by a special Committee on Safety (Seth Jackson, chairman):

"In line with recommendations of the Committee on Safety the Council recommends that foresters:

"1. Acquaint themselves with the safe practices applicable to occupations related to their fields.

"2. Acquaint themselves with the procedures for getting safe practices into use.

"3. Actively participate in safety programs, and

"4. That schools of forestry indoctrinate students in the principles of safety."

It is known that some of the institutions giving forestry provide certain courses or lectures in safety, but the extent to which such instruction is available to forestry students has never been compiled for all institutions. It will be appreciated, therefore, if you will send to the chairman of the Committee on Safety (1) a statement of the scope of safety instruction given your students in classroom and in field, and (2) your opinion as to whether the Society should try to develop information on safety applicable to the training of foresters. Any additional comments or suggestions you may care to make with respect to this general subject will be helpful.

Please send your reply direct to Seth Jackson, Forest Service, U. S. Department of Agriculture, Washington 25, D. C.

Important Notice to Subscribers

If you change your address please notify the JOURNAL OF FORESTRY, preferably in advance, by letter, post card, or post office form number 225. Be sure to give your old, as well as the new, address with your postal zone number if any.

You should also notify your local post office on postal form number 22 of your change of address. Both postal forms are obtainable at any post office.

Copies of the JOURNAL will not be forwarded by the Post Office Department. Hence, in order to avoid missing your copy as well as to prevent extra expense to the Society in supplying duplicates, you are urged to notify the JOURNAL as soon as you know your new address, preferably a month in advance.

JOURNAL OF FORESTRY
825 Mills Building
17th Street at Pennsylvania Avenue, N. W.
Washington 6, D. C.

Dues Deductible

In filing U. S. income tax reports, all members may classify dues paid to the Society of American Foresters as deductible expense.

Dues for 1953 should be paid promptly and in no case should they remain unpaid after June 30, 1953. Members whose dues are not paid by that date will receive no further issues of the JOURNAL OF FORESTRY until dues are paid.

Candidates for Membership

Candidates for admission, advancement, or reinstatement whose membership applications were received in the Society office during the month of November are listed below.

Action regarding the eligibility of these candidates will be taken by the Council as of February 1, 1953. Any communications from voting members relating to the membership eligibility of any of these candidates should be received in the Society office prior to that date.

Allegheny Section

Student Grade

PENNSYLVANIA STATE COLLEGE

Dambly, D. A.
Harris, C. D.
Sell, C.

Appalachian Section

Student Grade

NORTH CAROLINA STATE COLLEGE

Adams, P. W.
Barrett, J. P.
Biggert, J. C.
Cobb, F. W., Jr.
Dutka, O. J.
Nicholson, J. E.
Pierson, G. H.
Sewell, C. S.

Junior Grade

Masten, J. C., Forester, Cape Fear Wood Corp., Elizabethtown, N. C.; N. C. State, B.S.F., 1951.

Paschal, W. J., Timber Buyer and Woods Mgr., J. G. Paschal Lbr. Co., Lillington, N. C.; N. C. State, B.S.F., 1950.

Walls, L. J., Forester, Acme Wood Corp., Acme, N. C.; N. C. State, B.S.F., 1950.

Member Grade

Gunderson, G. K., Chief Forester, Seward Luggage Mfg. Co., Petersburg, Va.; Wheaton College, B.S., (Geology), 1939; Univ. of Mich., M.F., 1941. (Junior, 1946).

Zulick, L. B., Dist. Forester, Int. Paper Co., Wilmington, N. C.; Pa. State, B.S.F., 1940; Univ. of Calif., M.S., 1941. (Junior, 1946).

Central Rocky Mountain Section

Student Grade

COLORADO A & M COLLEGE

Andresen, F. R.
Crawford, R. J.
Davis, J. R.
Dybing, C. D.
Gallagher, D. G.
Pitcher, K. A.
Rhoads, R. E.
Wingerter, H. T.

Member Grade

Herschler, J. B., Chief Rgr., Rocky Mt. Natl. Park, Estes Park, Colo. (Junior, 1946).

Central States Section

Student Grade

MICHIGAN STATE COLLEGE

Falasky, E. V., Jr.
Cuzman, E. J.
Holton, G. R.
Parker, W. T.

UNIVERSITY OF MICHIGAN

Boublik, C. F.
Leach, M. S.
Schmeekpeper, T. G.

PURDUE UNIVERSITY

Beall, F. R.
Biddle, G. H.
Blann, E. B.
Burns, J. T.
Doub, R. L.
Gorrell, J. W.
Long, J. T.
Mathison, T. E.
Michel, R. W.
Murray, J. R.
Siegworth, H. D.
Stanger, L. O.
Wilkinson, E. G.
Zurbriggen, D. J.

— about orange as a color for tree-marking paint . . .

Although yellow, white, blue and red (—in that order) are the established standards for tree-marking paint colors, orange is coming in for considerable attention. For instance:

—from NEW YORK: "This state has some 30 foresters to give technical service to private woodland owners under the NY Forest Practice Act. Timber marking is a popular service. Since New York marks boundaries of its extensive forest preserve lands with yellow, use of yellow as a timber marking color would be misleading. We have selected *orange* for this purpose and find it very distinctive."

—and from PENNSYLVANIA: "We use *orange* timber marking paint to mark take-out and cull trees. This color, we find, stands out best to foresters cruising a large area. It is also an unmistakable contrast with blue which we use to mark trees that are to remain."

On the other hand, a firm with a high percentage of deciduous trees in its holdings notes: "*Orange* used in test markings proved very difficult to spot later. Particularly when leaves are changing color, the orange marks blend in and become lost far more readily than the old standard yellow."

—What do *you* think? Is orange perhaps the color that will become standard for tree-marking paint? Because of the interest shown in it, we are making orange available now as a standard SOUTHERN GLO color, along with yellow, white, blue and red. Order ready-mixed or paste.

SOUTHERN COATINGS & CHEMICAL CO.
Dept. J-2, Sumter, S. C.

Member Grade

Cooper, J. R., Procurement Mgr., Koppers Co., Inc., Marietta, Ohio; La. State, B.S.F., 1940; Yale, M.F., 1946. (Junior, 1946).
Haskins, F. H., Dist. Forester, Forestry Div., Dept. of Cons., Fife Lake, Mich.; Mich. State, B.S.F., 1940. (Junior, 1946).

Affiliate Grade

Wall, C. O., Forest Prod. Inspt., A. W. Williams Inspt., Co., Mobile, Ala.; Mich. College of Mining and Tech., B.S., (Forestry), 1951.

Columbia River Section

Student Grade

OREGON STATE COLLEGE

Brady, L. J.
Davidson, D. M.
Deckebach, F. G.
DuBay, J. L.
Goedhard, A.
Johnson, V. C.
Keene, D. F.
Lindberg, E. C.
McDonald, E. C.
Pepper, E. E.
Rouse, C. E.
Spray, R. H.
Walker, S. M.

Junior Grade

Brandis, J. S., Logging Mgr., Willamette Valley Lbr. Co., Dallas, Oreg.; Oregon State, B.S.L.E., 1938.
Weissenfluh, C. E., Thr. Mgmt. Asst., Ochoco Nat'l. Forest, Prineville, Oreg.; Oregon State, B.S.F., 1950.

Member Grade

Miles, J. R., Logging Engr., Edward Hines Lbr. Co., Hines, Oreg.; Univ. of Idaho, B.S.F., 1941. (Junior, 1946).
Reynolds, C. E., Cons. Forester, 7715 S. E. 32nd Ave., Portland, Oreg.; State Univ. of N. Y., B.S.F., 1933; M.S.F., 1935. (Junior, 1933R53).
Weed, O. F., Asst. Resident Sales Mgr., Weyerhaeuser Thr. Co., Longview, Wash.; Oregon State, B.S.F., 1946. (Junior, 1946).
Youngberg, C. T., Asst. Prof. of Soils, Oregon State, Corvallis, Oreg.; Wheaton College, B.S., 1941; Univ. of Mich., M.F., 1947; Univ. of Wisc., Ph.D., 1951. (Junior, 1948).

Gulf States Section

Student Grade

LOUISIANA STATE UNIVERSITY

Craft, H. W.
Givens, T. E.
Kornman, W. M.
Ladner, B. J.
Lee, B.
Logan, R. D.
Martin, R. B.
Myers, J. C.
Parsons, G. A.
Toney, J. L.
Van Dine, D. G.

Junior Grade

Gibson, W. J., Area Forester, Miss. Forestry Comm., Lexington, Miss.; Univ. of Mo., B.S.F., 1952.
Hennigan, J. T., Forester, Gaylord Container Corp., Bogalusa, La.; La. State, B.S.F., 1951.
Piepenbring, R. L., Field Asst. in Cons., Int. Paper Co., Alexandria, La.; Univ. of Mo., B.S.F., 1949.

Member Grade

Foster, J. U., Mgr., Treating Div., Southern Pine Lbr. Co., Diboll, Texas; La. State, B.S.F., 1940. (Junior, 1946).
Guthrie, J. G., Forester, L. N. Dantzler Lbr. Co., Perkinston, Miss.; Purdue, B.S.F., 1948. (Junior, 1948).
Samson, N. T., Asst. Prof. of Forestry, Stephen F. Austin State College, Nacogdoches, Texas; State Univ. of N. Y., B.S.F., 1942; M.S., 1947; Ph.D., 1952. (Junior, 1946).
Zobel, B. J., Assoc. Silviculturist, Texas Forest Service, College, Texas; Univ. of Calif., B.S.F., 1943; M.F., 1949; Ph.D., 1951. (Junior, 1946).

Affiliate Grade

Harsdorff, F. D., Jr., Forester, Kirby Lbr. Corp., Silsbee, Texas; Stephen F. Austin State College, B.S., (Forestry), 1950.

Inland Empire Section

Student Grade

UNIVERITY OF IDAHO

Curtis, A. B.
Jinsel, H. W.
Hollett, G. K.

Affiliate Grade

Cassetta, F. J., Compassman, Diamond Match Co., Newport, Wash.; State College of Wash., B.S., (Forestry), 1952.

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S. GAYLEY ATKINSON
Consulting Forester
Huntingdon Road
Huntingdon Valley, Pa.

Intermountain Section

Member Grade

Deshler, W. O., Forester, Cottonwood Rgr. Sta., Boise, Idaho; Univ. of Idaho, B.S.F., 1940. (Junior, 1947).
Jacobs, J. L., Forester, U.S.F.S., Provo, Utah; Utah State Agric. College, B.S.F., 1932. (Junior, 1947).

Affiliate Grade

Makela, H. J., Forester, U.S.F.S., Vernal, Utah; Mich. College of Mining and Tech., B.S., (Forestry), 1948.

Kentucky-Tennessee Section

Junior Grade

Hamlin, W. W., Asst. Forester, Cumberland Cast. Co., Chattanooga, Tenn.; Univ. of Minn., B.S.F., 1952.

Member Grade

Boardman, D. S., Forester, T.V.A., Bristol, Tenn.; Univ. of Minn., B.S.F., 1940. (Junior, 1946).

New England Section

Junior Grade

Crafts, H. L., Forester, New England Forestry Foundation, Newcastle, Maine; Univ. of Maine, B.S.F., 1952.
Thurston, H. F., Forest Engr., Int. Logging Corp., Chisholm, Maine; Univ. of Maine, B.S.F., 1950.

Affiliate Grade

Rines, W. R., Scaler, Brown Co., Parmachenee, Me.; Univ. of N. H., B.S., (Forestry), 1951.

Northern California Section

Student Grade

UNIVERSITY OF CALIFORNIA

Binninger, D. L.	Lavell, R. M.
Caster, P. B.	Webber, H. M.
Ladd, M. W.	Zaerr, J. B.

Junior Grade

McPherson, S. G., Special Agent and Engr., Northern Assurance Co., Ltd., Oakland, Calif.; Univ. of Calif., B.S.F., 1948.
Storey, T. G., Forester, U.S.D.A., Calif. Forest and Range Exp. Sta., Berkeley, Calif.; Univ. of Calif., B.S.F., 1948.

Member Grade

Callaghan, J., Deputy State Forester, Calif. Div. of Forestry, Redding, Calif.; Univ. of Calif., B.S.F., 1937. (Junior, 1946).
Service, R. K., Forester, Collins Pine Co., Chester, Calif.; Univ. of Calif., B.S.F., 1939. (Junior, 1946).
Yingst, J. H., Jr., Logging Mgr., Simpson Logging Co., Klamath, Calif.; Pa. State, B.S.F., 1939. (Junior, 1946).

Affiliate Grade

Lampi, E. H., Park Rr. Nat'l. Park Service, Mineral, Calif.; Mich. College of Mining and Tech., B.S., (Forestry), 1950.

Ozark Section

Student Grade

UNIVERSITY OF MISSOURI

Oonk, G. B.

Member Grade

Capps, O. B., Dist. Forester, Mo. Cons. Comm., Jefferson City, Mo.; Univ. of Mich., B.S.F., 1948; M.F., 1948. (Junior, 1948).
Dorsett, G. L., Forester, U. S. Naval Ammunition Depot, Shumaker, Ark.; Univ. of Mich., B.S., 1943; Iowa State, M.S., 1949. (Junior, 1946).
McDermott, R. E., Dept. of Forestry, Univ. of Mo., Columbia, Mo.; Iowa State, B.S.F., 1943; M.S., (Botany), 1947; Duke, Ph.D., 1952. (Junior, 1946).

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Anderson, H. W.	Flemer, T. A.
Barr, K. J.	Grove, B. F.
Beckwith, W. K.	Meltvedt, D. E.
Burks, M. J.	Olson, L. W.
Campbell, H. G.	Olson, O. E.
Ellis, C. M.	Pratt, F. V.

Member Grade

Dyson, D. E., Forester, Seaboard Lbr. Co., Seattle, Wash.; Univ. of Wash., B.S.F., 1942. (Junior, 1942).
Graves, K. K., Cost Engr., Washington Veneer Corp., Olympia, Wash.; Univ. of Wash., B.S.F., 1943; Yale, M.F., 1946. (Junior, 1946).
Noonan, D. W., Asst. Dist. Forest Warden, State Forestry Headquarters, Shelton, Wash.; Univ. of Wash., B.S.F., 1940. (Junior, 1946).

Southeastern Section

UNIVERSITY OF FLORIDA

Student Grade

Park, G. H.	Skinner, R. B.

UNIVERSITY OF GEORGIA

Arnbal, A. K.	Hogan, L. D.
Bowers, J. L.	Lynch, T. J.
DeMars, C. J.	Reeves, J. D.
Dennis, C. S.	Smith, R. A.
Hellams, R. B.	Turner, W. Q.
Hoeussler, F. W.	

Junior Grade

Brown, C. W., U. S. Army, Valdosta, Ga.; Univ. of Fla., B.S.F., 1949.
Connell, A. M., U. S. Army, Ocala, Fla.; Univ. of Fla., B.S.F., 1952.
Glidewell, C. F., Landhunter, Int. Paper Co., Panama City, Fla.; Univ. of Fla., B.S.F., 1951.
Gresham, T. A., State County Forester, Schley County Forestry Unit, Ellaville, Ga.; A.P.I., B.S.F., 1950.
Shearer, E. C., Field Mgr., and Vice Pres., Farrens Tree Surgeons, Inc., Jacksonville, Fla.; Pa. State, B.S.F., 1942.
Wilder, D. L., Thr. Aide, Piedmont Nat'l. Wildlife Refuge, Round Oak, Ga.; Univ. of Mo., B.S.F., 1949.

Southern California Section

Junior Grade

McFarland, M. B., Gen. Mgr., M. B. McFarland and Sons, McFarland, Calif.; Univ. of Calif., B.S.F., 1948.

SOUTHWESTERN SECTION

Member Grade

Bailey, D. L., Area Mgr., Bureau of Land Mgmt., Albuquerque, N. Mex.; Univ. of Wash., B.S.F., 1937. (Junior, 1946).

Upper Mississippi Valley Section

Junior Grade

IOWA STATE COLLEGE

Burdett, P. E.	Kuester, A. F.
Cooper, G. A.	Marshall, H. J.
Crellin, J. S.	Mitchell, L. A.
Kreger, P. B.	True, M. G.

UNIVERSITY OF MINNESOTA

Adams, G. L.	Murphy, E. E.
Arkins, R. J.	Myshak, R. J.
Crawford, D. W.	Perske, R. A.
Crosby, C. E.	Rhoades, H. E.
Eck, L. H.	Rudolph, T. D.
King, D. A.	Shaw, D. B.
McGowan, J. E.	Simon, G. R.

Junior Grade

Stoeckeler, E. G., Perma Frost Div., Corps of Engrs., St. Paul, Minn.; Univ. of Minn., B.S.F., 1942.
Jankowski, E. J., Forester, Northwest Paper Co., Cloquet, Minn.; Univ. of Calif., B.S.F., 1941; M.S.F., 1942. (Junior, 1946).

Washington Section

Junior Grade

Tigerman, M. H., Forester, U.S.D.A., Washington, D. C.; Colo. A & M., B.S.F., 1943; M.F., 1952.

Member Grade

Heath, G. R., Photo Interpretation Spec., U.S.F.S., Washington, D. C.; Univ. of Me., B.S.F., 1936. (Junior, 1946).

Wisconsin-Upper Michigan Section

Junior Grade

Beckwith, L. C., Entomologist, Bur. of Ento. and Plant Quarantine, Milwaukee, Wisc.; State Univ. of N. Y., B.S., 1951; M.F., 1952.
Youngs, R. L., Forest Products Tech., U.S.F.S., Madison, Wisc.; State Univ. of N. Y., B.S., (Wood Tech.), Univ. of Mich., M.S., (Wood Tech.), 1950.

Member Grade

Evans, G. L., Logging Supt., Wenos Lbr. Co., Iron River, Mich.; Univ. of Mich., B.S.F., 1945; M.F., 1946. (Junior, 1946).
Harris, E. F., Wood Chemist, Forest Products Lab., Madison, Wisc.; Hamline Univ., B.S., (Chemistry), 1921; Univ. of Minn., M.S., 1922; Ph.D., 1925. (Junior, 1946).

Affiliate Grade

Blake, F. E., Consumer Repre., Scott Paper Co., Oconto Falls, Wisc.; Mich. College of Mining and Tech., B.S., (Forestry), 1941.
Makinen, R. L., Supv. Engr., U.S.F.S., Manistique, Mich.; Mich. College of Mining and Tech., B.S., (Forestry), 1950.

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Consulting Foresters

Approved for Listing on January 1, 1953, by the

SOCIETY OF AMERICAN FORESTERS

The following List of Consulting Foresters is published by the Society of American Foresters for the information of prospective clients.

Individuals listed are members of the Society of American Foresters and as such are believed qualified and competent to perform the technical services specified. However, the Society cannot assume responsibility for the actions of individuals or firms listed.

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Code of Fields of Specialization

1. Arboriculture and tree preservation.
2. Cost and economic studies of forest operations.
3. Forest and wood utilization.
4. Forest management and silvicultural practice.
5. Forest protection from disease.
6. Forest protection from fire.
7. Forest protection from insects.
8. Forest taxation.
9. Game and wildlife management.
10. Logging engineering.
11. Market studies and trade promotion (forest products).
12. Naval stores operations.
13. Pulpwood operations.
14. Range management.
15. Surveying and mapping.
16. Timber valuation and appraisal.
17. Timber volume and quality estimates.
18. Tree planting and reforestation; reproduction studies.
19. Wood preservation.
20. Wood seasoning.
21. Wood technology.

Raymond D. Adolph, 44 Roe Park, Highland Falls, New York.
Territory: Southeastern New York.
Specialization: 4, 5, 6, 7, 18.

Thos. W. Alexander, Consulting Forester, Waynesville, North Carolina.
Territory: South, Central States, and Appalachians.
Specialization: 2, 4, 11, 16, 17.

John R. Allison, 483 W. Palmetto Street, Florence, South Carolina.
Territory: Eastern South Carolina.
Specialization: 3, 4, 6, 7, 13, 16, 17, 18.

Glenn O. Antonie, Consulting Forester, Box 134, Linden, Alabama.
Territory: Alabama, Mississippi.
Specialization: 2, 3, 4, 5, 6, 7, 8, 12, 13, 15, 16, 17, 18. Also agent for absentee timber owners; timber sales and cutting supervision; forest litigation.

Milton Applefield, Consulting Forester, Box 13, Conway, South Carolina.
Territory: South coastal plain.
Specialization: 3, 4, 10, 13, 15, 16, 17, 18. Also sawmill efficiency studies; litigation and damage claims.

S. Gayley Atkinson, Consulting Forester, Huntingdon Road, Huntingdon Valley, Pennsylvania.
Territory: Pennsylvania.
Specialization: 1, 18.

Henry L. Bango, Consulting Forester, P.O. Box 4072, Shreveport, Louisiana.
Consultant: Frank Gaenschals.
Territory: Northern Louisiana.
Specilization: 3, 4, 5, 16, 17, 18. Also purchase and sale of timbered properties.

George Banzhaf & Company, 662 North Water St., Milwaukee 2, Wisconsin.
Territory: Not Limited.
Specialization: 2, 3, 4, 8, 11, 13, 15, 16, 17.

Belanger and Bourget, Land Surveyors and Forest Engineers, 86 Cote de la Montagne, Quebec, Canada.
Consultant: M.-Albert Bourget.
Territory: Canada, especial Quebec.
Specialization: 2, 3, 4, 10, 11, 13, 15, 16, 17, 19, 20, 21. Also boundary lines.

Frank W. Bennett & Associates, Consulting Foresters, 1216 Louisiana National Bank Bldg., Baton Rouge, Louisiana. (Field Hdqrs. at Norwood, La.)
Consultants: Frank W. Bennett, W. C. Snyder.
Territory: Southern U. S.
Specialization: 3, 4, 6, 10, 11, 16, 17, 18. Retained as consultants by medium size landowners (300 to 20,000 acres). Manage all forest land resources, including timber, grazing, wildlife, minerals, etc.

Bigley and Feiss, Foresters, Inc., 767 Blair Blvd., Eugene, Oregon.
Consultants: Sherman Feiss, John Venator.
Territory: Washington, Oregon, California.
Specialization: 2, 3, 4, 6, 15, 16. Also sustained yield plans, supervision of contract logging, and timberland sales.

Bishop Brothers, Consulting Foresters, Marion, South Carolina.
Consultant: H. F. Bishop.
Territory: South Carolina and southeastern U. S.
Specialization: 3, 4, 6, 8, 10, 13, 15, 16, 17, 18.

L. L. Bishop, Forest Consultant, 7014 Airline, Houston 9, Texas.
Territory: East Texas.
Specialization: 4, 6, 16, 18.

Jack C. Blakeney, Consulting Forester, % Hickory Handle Co., Inc., P. O. Box 253, Batesburg, South Carolina.
Territory: South Carolina.
Specialization: 3, 4, 6, 7, 11, 13, 16, 17, 18.

Lewis M. Boice, Consulting Forester, Orangeburg, South Carolina.
Territory: Within 100 miles of Orangeburg.
Specialization: 4, 15, 16, 17.

Gordon Bowker, Consulting Forester, Registered Land Surveyor, % J. W. Lyle, Richburg, South Carolina.
Territory: Eastern U. S.
Specialization: 4, 9, 15, 16, 17, 20. Advice on plantation management.

Robert K. Boydell, 810 West Pine St., Hattiesburg, Mississippi.
Territory: Mississippi, Alabama, Louisiana.
Specialization: 2, 3, 4, 12, 13, 16, 17, 18. Also forest mapping from aerial photographs, and growth studies.

William J. Bozett, Consulting Forester, Logan, Ohio.
Territory: Ohio and Northern Kentucky.
Specialization: Timber, Management and Marketing.

Allen W. Bratton, Consulting Forester, Shelterwood, Cooperstown, New York.
Territory: Northeast.
Specialization: 4, 5, 6, 7, 8, 11, 15, 16, 17, 18.

Brown and Brown, Forest Engineers, 614 Lewis Building, Portland 4, Oregon.
Consultants: Eugene R. Walsh (S.A.F. Associate Member), Samuel Rotschy.
Territory: Pacific coast.
Specialization: 2, 3, 4, 6, 8, 10, 11, 12, 15, 16, 17, 18.

Nelson C. Brown, Consulting Forester, 122 Dorset Road, Syracuse 10, N. Y. During summers, Milford, Pa.
Territory: Northeast.
Specialization: 2, 3, 8, 10, 11, 13, 16, 17.

Charles H. Bunting, Timber Cruiser, 2439 Placer St., Redding, California.

Territory: California.
Specialization: 2, 10, 15, 16, 17.

California Foresteering, 429 Main Street, Placerville, California.
Consultant: Wm. B. Berry.
Territory: California pine region.
Specialization: 2, 3, 4, 10, 16. New solutions to the old problems of logging, milling, and timber management.

N. D. Canterbury, Consulting Forester, 4214 St. Emanuel Street, Apt. 3, Houston 4, Texas.
Territory: Texas and southeastern U. S.

Dudley C. Carey, 116 Fairmeade Road, Louisville 7, Kentucky.
Territory: Not limited.
Specialization: Forest and wood utilization, wood preservation, wood seasoning, wood technology. Also planning for wood conversion operations.

Floyd F. Clark, Consulting Forester, Sky Ranch, Box 756, Ocala, Florida.
Territory: Southeast.
Specialization: 2, 3, 4, 6, 8, 9, 12, 13, 14, 15, 16, 17, 18. Also sale of timber properties; combined timber—cattle operations in the Southeast; insurance company representation for timber and range land.

John D. Coffman, 286 Lenox Ave., Oakland 10, California.
Territory: Principally California.
Specialization: 5, 6, 7, 16. Also forest and park recreational management.

T. S. Coile, Consulting Forester and Soil Scientist, Duke University, Durham, North Carolina.
Territory: Virginia to Texas; northern Rockies; Pacific Northwest.
Specialization: 4, 15, 16, 17, 18. Also determination of productive capacity of land for forest crops; soil evaluation; and land management.

Connwood, Inc., South Main Street, Cheshire, Connecticut.
Consultants: Ralph C. Hawley, Michael M. Pochan, Jr.
Territory: Connecticut and adjacent areas.
Specialization: 3, 4, 10, 11, 13, 15, 17, 18, 19, 21.

Consulting Foresters, 4970 Kingsley Drive, Indianapolis, Indiana.
Consultants: Robert F. Davis, D. K. Goodwin.
Territory: Indiana.
Specialization: 4, 10, 11, 16, 17, 18.

David B. Cook, Consulting Forester, 12 McPherson Terrace, Albany 6, New York.
Territory: Eastern New York.
Specialization: Planted larch.

Philip T. Coolidge, Consulting Forester, 31 Central Street, Bangor, Maine.
Territory: Not limited.
Specialization: 2, 4, 8, 10, 13, 15, 16, 17, 18. Also farm appraisal.

William T. Cox, Consulting Forester and Biologist, 2186 Doswell Avenue, St. Paul 8, Minnesota.
Territory: General.
Specialization: Appraisals of forest properties; development of furbearers and other wildlife; selection of new locations for woodworking plants.

Keith Cranston & Associates, Leland, Mississippi.
Associates: R. M. Monteith, Jr. (Air Force), John M. Nibert, Bob Jiles.
Territory: Mississippi River Delta, and entire Gulf States Hardwood Bottomlands and Pine Types from Tennessee-Kentucky south.
Specialization: Bottomland Hardwood management, and supplemental commercial cruising. Retained in consultant capacity by firms operating in the South, and as Consultant-Manager for private landowners of bottomland hardwood and pine tracts.

C. P. Cronk, 10 Crown Ridge Road, Wellesley, Massachusetts.
Territory: Not limited.
Specialization: Studies in industrial forestry, with particular reference to problems in utilization, production, merchandising, and public relations.

Lucas M. Dargan, Consulting Forester, P. O. Box 167, Darlington, South Carolina.
Territory: Coastal Carolinas.
Specialization: 4, 9, 16, 17, 18. Also forest mapping and timber location studies from aerial photographs.

Randle J. Dedeaux, Consulting Forester, P. O. Box 52, Perkinson, Mississippi.
Territory: Southern Mississippi; longleaf and slash pine types.
Specialization: 4, 13, 15, 17. Also growth studies, timber marking and marketing, and agent for absentee timberland owners.

A. Norman Dietrick, Consulting Forester and Soil Conservationist, R. D. 3, Box 355, Stroudsburg, Pa.
Territory: Northeastern Pennsylvania and nearby areas in New York and New Jersey.
Specialization: 4, 9, 16, 17. Also farm forestry, municipal and county forests, fish pond construction and management.

W. T. Doherty, Consulting Forester, 421 Morningside Dr. N.E., Albuquerque, New Mexico.
Territory: Arizona, New Mexico.
Specialization: 4, 15, 16, 17. Also land classification.

William A. Eastman, Jr., Consulting Forester, William A. Eastman & Co., Inc., 410 Green Building, Seattle 1, Washington.
Territory: Pacific Northwest.
Specialization: 10, 15, 16, 17, 18. Also preparation and administration of timber sales, land appraisal, timberland brokerage, and timberland management.

Nils B. Eckbo, Industrial Forestry Consultant, 26 Rhodes Avenue, Parktown, Johannesburg, South Africa.
Territory: Southern Africa.
Specialization: Industrial forestry.

W. G. Edwards, 503 West Fairmount Ave., State College, Pennsylvania.
Specialization: 3, 10, 13, 15, 16, 18. Also small sawmill problems, both logging and milling phases.

Carl F. Ehelebe, 5921 S. E. Monroe St., Milwaukie 22, Oregon.
Territory: Mexico pine regions.
Specialization: Cost and economic studies of forest operations, forest and wood utilization, market studies and trade promotion (forest products), timber valuation and appraisal.

Inman F. Eldredge, Sr., 1354 Moss Street, New Orleans 19, Louisiana.
Territory: Lower South.
Specialization: Resource surveys for large operations; advice and counsel in large-scale land purchase programs; consultation with forestry staffs on management policy and practice in larger operations.

L. J. Enright, Consulting Forester, P. O. Box 238, College Park, Maryland.
Territory: Maryland; not limited.
Specialization: 1, 6, 15, 18. Also park management and policy; landscape planting and design.

Charles F. Evans, Consulting Forester, 2867 Piedmont Road, Atlanta, Georgia.
Territory: Southeastern U. S.
Specialization: 4, 6, 16, 17, 18. (Registered Forester under Georgia state law.)

Farmcraft Associates, Inc., Forest Managers, 5402 Almeda, Houston, Texas and Box 4344, Alexandria, Louisiana.
Consultants: Stuart F. Clark, Leo McDonald, Bob Isom, Tom Lawrason.
Territory: Southern U. S.
Specialization: Forest investments and technical forest and range management for private and industrial holdings.

David S. Findlay, Consulting Forester, 20 East 5th Street, Jamestown, New York.
Territory: Western New York and Pennsylvania.
Specialization: 4, 15, 16, 17.

George M. Fisher, Consultant Landscape Forester, P. O. Box 300, Tyler, Texas.
Territory: Northeastern Texas.
Specialization: 1, 5, 7, 9, 18. Also city forestry and shade tree problems; landscape design, construction, and maintenance; forest parks and recreational planning.

C. V. Fisk, Consulting Forester, P. O. Box 524, Chariton, Iowa.
Territory: Iowa, Missouri, Nebraska, Kansas, Illinois.
Specialization: 4, 9, 16, 17. Also farm forestry.

Reginald D. Forbes, Consulting Forester, R.F.D. 1, Ambler, Pennsylvania.
Territory: Eastern U. S.
Specialization: 4, 6, 17, 18. Also forest resource surveys of timber available to manufacturing plants in specified territories.

Forestry Aids, Manning, South Carolina.
Consultants: Seymour I. Somberg,

Richard E. Haas.
Territory: Southeastern U. S.
Specialization: 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 20. Acquisition and management for investors; forest resource surveys for industry.

Forestry Consulting Services, 720 South Durand, Jackson, Michigan.
Consultant: George D. Blair.
Territory: Midwest.
Specialization: 1, 2, 4, 11, 16, 19. Also various forest growth and vegetative control planning services to public utility industries.

Forestry Suppliers, Inc., Consulting Foresters and Suppliers, Battlefield Station, Jackson 4, Mississippi.
Consultants: Ben C. Meadows, Purvis R. Huff.
Territory: Gulf States.
Specialization: 3, 4, 6, 13, 15, 16, 17, 18. Also forest land analysis and management, growth studies, timber and land sales, and a complete line of supplies and equipment for foresters and timber owners.

Edwin H. Francis, Consulting Forester and Landscape Engineer, Varysburg, New York.
Territory: Western New York.
Specialization: 18. Also landscape and recreational planning and construction on estates and small homes.

R. C. Fraunberger, Forest Products Business Consultant, Marshfield, Wisconsin.
Specialization: 2, 3, 4, 10, 11, 16, 17, especially in hardwoods, domestic and foreign.

E. A. Friend, Jr., 211 Causey Ave., Suffolk, Virginia.
Territory: Tidewater and Eastern Shore of Virginia, Northeast North Carolina.
Specialization: 4, 13, 16, 17. Absentee landowners' agent, damage and condemnation claims.

Emanuel Fritz, Consulting Forester, 102 The Uplands, Berkeley 5, California.
Territory: California; pine and redwood.
Specialization: 2, 3, 4, 6, 10, 11, 16, 17, 18, 19, 20, 21. Also consultant on state forest and park management and policy.

LeRoy Frontz, Consulting Forester, Allenwood, Pennsylvania.
Territory: Eastern U. S.
Specialization: 3, 4, 5, 6, 7, 9, 16, 17, 18. Also landscaping, forest and ornamental nurseries, farm forestry, forest parks and recreation, landuse planning, soil conservation, farm evaluation and appraisal.

William E. Garvey, Jr., La Plata, Maryland.
Territory: Charles, St. Marys, Calvert, Anne Arundel, and Prince Georges Counties in Maryland.
Specialization: Timber cruising, appraisal and marking.

Charles M. Genaux, R.F.D. 2, Box 528, Alexandria, Virginia.
Specialization: 2, 3, 4, 5, 6, 8, 11, 13, 16, 17, 18, 19. Also analysis and development of public and private forestry programs, and Washington representation.

John D. Gilmour, Consulting Forester, 5823 McLynn Avenue, Montreal, Quebec, Canada.
Territory: Not limited.
Specialization: 2, 4, 8, 10, 16, 17. Also tropical logging.

Nathan B. Golub, Consulting Forester, Buckstone Farm, Washington Crossing, Pennsylvania.
Territory: Pennsylvania and New Jersey.
Specialization: 4, 15, 16, 17, 18. Also water management plans. Registered engineer in Pennsylvania.

R. W. Graeber, Consulting Forester, 303 Hillcrest Road, Raleigh, North Carolina.
Territory: North Carolina.
Specialization: 4, 6, 13, 16, 17, 18. Also buying and selling timber and timberlands as service to either buyer or seller; adjusting problems arising from over-cutting or trespass.

Grant and Evans, Licensed Engineers, 415 Pacific Building, Roseburg, Oregon.
Consultant: Richard C. Grant.
Territory: Oregon.
Specialization: 10, 15, 16, 17.

T. F. Grayson and Company, Commercial Foresters, P. O. Box 110, Prescott, Arkansas.
Territory: Southeastern U. S.
Specialization: 2, 4, 8, 10, 11, 13, 15, 16, 17, 18. Also timber purchase, sale, management, and millsite locations.

Green's Timber Service, Johnson City, Tennessee.
Consultant: L. Stanley Green.
Territory: Southeastern U. S.
Specialization: 2, 3, 4, 6, 10, 13, 16, 17, 18. Also custom sawmilling.

Clarence W. Griffith, 1001 Ouachita Bank Building, Monroe, Louisiana.
Territory: United States and Central America.
Specialization: 4, 15, 16, 17. Also purchase and sale of timbered properties.

Kenneth Wayne Guenther, Forest Products Industrial Engineer, Coos Bay, Oregon.
Territory: Oregon, Washington, and California.
Specialization: Those fields relative to the industrial engineering applications to the forest products industries.

Alvin B. Hafer, Consulting Forester, Laurinburg, North Carolina.
Territory: North Carolina, South Carolina, and Southeast.
Specialization: 4, 15, 16, 17. Also purchase and sale of timbered properties.

Albert G. Hall and Associates, 1740 K Street, NW, Washington 6, D. C.
Specialization: 2, 3, 4, 5, 6, 7, 8, 11, 13, 16, 17, 18. Also Washington representation.

Giles G. Hall, Professional Forester, 402 Cumberland Avenue, North Augusta, South Carolina.
Territory: South Carolina, Georgia.
Specialization: 2, 3, 4, 5, 6, 7, 10, 11, 13, 16, 17, 18. Also tree pruning in planted stands.

Hammon, Jensen, and Wallen, Mapping and Forestry Services, 1209 8th Avenue, Oakland 6, California.
Consultants: Herbert A. Jensen, Arnold F. Wallen.
Territory: United States and foreign.
Specialization: 2, 3, 4, 6, 8, 10, 11, 13, 15, 16, 17, 18. Also planimetric and topographic mapping, land net delineation, general land classification for appraisal purposes and ranchland management, and aerial photogrammetric consulting service. Emphasis on aerial photo techniques in all activities.

David H. Hanaburgh, Consulting Forester, Buchanan, New York.
Territory: Northeast.
Specialization: 2, 3, 4, 9, 10, 11, 13, 16, 17. Also negotiation of rights for hunting, fishing, trapping, and water storage.

E. J. Hanzlik, 2113 N.E. Clackamas St., Portland 12, Oregon.
Territory: Oregon and Washington.
Specialization: 2, 4, 11, 13, 16. Also farm woodland and small ownership management; forest litigation; negotiating cooperative sustained yield units; public relations; timber sales, acquisition, and exchanges; determination of sustained yield possibilities of forest properties.

T. A. Hardes Lumber Company, P. O. Box 239, Bradford, Pa.
Consultant: Svend B. Rondum, William C. Kneektel.
Territory: N. W. Pennsylvania and S. W. New York.
Specialization: 2, 4, 6, 10, 11, 13, 16, 17, 18.

Rex S. Harper, Consulting Forester, 918 Hawthorne St., Tallahassee, Florida.
Territory: Florida, Georgia.
Specialization: 4, 5, 6, 7, 16, 17.

Ralph W. Hayes, Consulting Forester, 2241 Myrtle Avenue, Baton Rouge, Louisiana.
Territory: Gulf States.
Specialization: 2, 3, 13, 15, 16, 17. Also investigation and settlement of claims regarding timber in use in the South.

K. J. Helmick, Consulting Forester, 50 Circle Drive, Fort Collins, Colorado.
Territory: Colorado, Wyoming, South Dakota, Utah, New Mexico.
Specialization: 4, 10, 15, 16, 17.

Hiram L. Henderson, Manufacturer of Dry Kilns, 119 Stone Ridge Drive, Syracuse, New York.
Territory: Principally eastern states.
Specialization: 20. Also construction of lumber dry kilns.

Victor W. Herlevich, Consulting Forester, 35 Ivey Circle, Wilmington, North Carolina.

Territory: North Carolina, South Carolina.
Specialization: 4, 6, 15, 16, 17, also forest fire damage appraisals.

Halsey M. Hicks, Consulting Forester, R. F. D. 3, Brattleboro, Vermont.
Territory: Not limited.
Specialization: 2, 3, 4, 8, 15, 16, 17.

Hamilton D. Hill, Consulting Forester, Glacier Creek Ranch, Seeley Lake, Montana.
Territory: Northern Rocky Mountain region.
Specialization: 4, 15, 16, 17, 18. Also highway location and construction surveys; detailed topographic surveying and mapping preliminary to irrigation.

Monterey L. Holst, Consulting Forester, P. O. Box 125, East Greenwich, Rhode Island.
Territory: New England.
Specialization: 3, 4, 6, 9, 10, 13, 15, 16, 17, 18, 21.

Douglas F. Horan, Consulting Forester, 321 South Iowa Avenue, Lakeland, Florida.
Territory: Florida.
Specialization: 4, 11, 15, 16, 17.

William P. House, Consulting Forester, Chesham, N. H.
Territory: New Hampshire and adjacent areas.
Specialization: 2, 3, 4, 16, 17. Also marking and stumpage sales.

Richard F. Howard, Forestwald, Box [illegible], Fredonlinville, New York.
Territory: Pennsylvania, New York, New England.
Specialization: 3, 4, 6, 15, 16, 17, 18.

T. M. Howerton, Jr., Consulting Forester, Madison, Florida.
Territory: Southeastern states.
Specialization: 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15, 16, 17, 18.

James L. Huff, Consulting Forester, Dillon, South Carolina.
Territory: North Carolina, South Carolina.
Specialization: 4, 6, 10, 16, 18.

G. W. Hult, Consulting Forester, 3029 Johnson Street, Corvallis, Oregon.
Territory: Oregon, California, and southwestern U. S.
Specialization: 4, 16, 17. Also estate woodlands management; negotiation of cooperative sustained yield units; timber sales, acquisition, and exchanges.

LeRoy W. Huntington, Consulting Tropical Forester, 52 Wesley Street, Baldwin, New York.
Territory: Latin America, Orient, Africa.
Specialization: 2, 3, 4, 10, 11, 15, 16, 17, 18; and tropical hardwoods.

R. Wilson Hutchison, Consulting Forester and Logging Engineer, 167 Walnut Lane, Eugene, Oregon.
Territory: Washington, Oregon, California.
Specialization: 2, 3, 4, 6, 10, 15, 16, 17. Registered professional engineer of the State of Oregon.

Gorham E. Jackson, Consulting Forester, 604 West Main Street, Washington, North Carolina.
Territory: Eastern North Carolina, southeastern Virginia. All forest types.
Specialization: 2, 4, 6, 9, 10, 13, 15, 16, 17, 18. Also investigations of forest resources for pulp and paper companies, and land agent for absentee timberland owners.

Stephen L. Jacobs, R.F.D. 3, Gorham, Maine.
Territory: Southern Maine.
Specialization: 4, 16, 17.

M. E. Jelley, Consulting Forester, 122 Haywood Avenue, Chattanooga 5, Tennessee.
Territory: Southeastern and eastern states.
Specialization: 2, 3, 4, 10, 11.

David G. Jennings, Consulting Forester, 206 Chestnut Street, Port Jefferson, New York.
Territory: New York.
Specialization: 1, 3, 4, 6, 15, 18.

F. J. G. Johnson, 709 Metropolitan Bldg., Vancouver, B. C., Canada.
Territory: British Columbia (no regional limitation).
Specialization: 2, 3, 4, 6, 11, 15, 16, 17. Also park and municipal forest development.

Ralph S. Johnson, Laurinburg, North Carolina.
Territory: Eastern Carolinas.
Specialization: 3, 4, 6, 13, 15, 16, 17.

Robert W. Jones, Rt. 2, Box 2187, Bellevue, Washington.
Territory: Washington.
Specialization: 10, 11, 15, 16, 17, 18. Also photogrammetry and court cases concerning boundary disputes.

E. V. Jotter, Consulting Forester, 30 Cedarlawn Drive, Dayton 5, Ohio.
Territory: Ohio, Kentucky.
Specialization: 3, 4, 6, 9, 11, 16, 17, 18. Also development and management of community forests, conservation education, cooperation with soil conservation districts.

Frank E. Karpick, 134 Kay St., Buffalo 15, New York.
Territory: Northeastern United States.
Specialization: 1, 5, 7. Landscaping, and planting and maintenance programs for city shade trees.

Keedwell & Elliott, Consulting Foresters, Emporia, Virginia.
Consultants: Stuart G. Keedwell and Frank A. Elliott.
Territory: Eastern and southern U. S.
Specialization: 3, 4, 10, 11, 13, 15, 16, 17. Also forest litigation and purchase and sale of land and timber.

John F. Kellogg, Forester, 317 Sibley St., Natchitoches, Louisiana.
Territory: Louisiana; pine and hardwood.
Specialization: 4, 5, 11, 16, 17.

Kiefer and Quaile, Consulting Foresters, Lakeville, Connecticut.
Consultant: George C. Kiefer, Jr.
Territory: Eastern U. S.
Specialization: 4, 6, 15, 16, 17, 18. Also management of timber properties and plantations, timber marking and marketing and agent for woodland owners.

H. Thorn King, Consulting Forester and Land Surveyor, Hancock, New Hampshire. (S.A.F. Affiliate Member.)
Territory: Southwestern New Hampshire.
Specialization: 2, 3, 4, 15, 16, 17, 18. Also private and farm forestry, scaling, marking, surveying, and title investigation.

Joseph C. Kircher, Consulting Forester, Mount Dora, Florida.
Territory: Southern U. S.
Specialization: 2, 4, 6.

G. E. Knapp, Consulting Forester, 661 Forest Hill Road, Macon, Georgia.
Territory: Southen states.
Specialization: 2, 4, 10, 11, 13, 16, 17, 18.

Robert F. Knoth & Company, Foresters, Appraisers, Surveyors, 39 Broad Street, Charleston 3, South Carolina.
Consultant: Robert F. Knoth.
Territory: American, Canadian and tropical timberlands. No restrictions.
Specialization: 4, 6, 10, 11, 13, 15, 16, 17, 18. Land agent for absentee timberland owners; foreign timberland investigations; veneer log inspection and procurement; timber investments.

Arthur Koehler, Wood Technologist, 2308 Eleventh Ave., Los Angeles 18, Calif.
Specialization: Wood utilization.

The Langdale Company, P. O. Box 980, Valdosta, Georgia.
Consultants: Harley Langdale, Jr., T. E. Connell.
Territory: Georgia, northern Florida; slash pine belt.
Specialization: 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19. Also custom sawing.

Frank M. Langford, Waverly, Tennessee.
Territory: Middle Tennessee, South Kentucky, and North Alabama.
Specialization: Timber management—evaluation and utilization.

Frank J. Lemieux, Consulting Forester, 734 Whitney Building, New Orleans, Louisiana.
Territory: Southern states, Mexico, Central and South America.
Specialization: 2, 4, 6, 13, 15, 16, 17.

Paul C. Lemon, Consulting Forester, State College, Albany 3, New York.
Territory: New York.
Specialization: 1, 6, 9, 14. Also commercial pilot, applications of aviation to forestry.

T. A. Liefeld, Consulting Forester, Thomasville, Georgia.
Territory: Florida, Georgia.
Specialization: 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 15, 16, 17, 18.

L. D. Lloyd, Consulting Forester, Flying L Ranch, Glenwood, Washington.
Territory: Worldwide.
Specialization: 2, 3, 4, 6, 8, 10, 13, 15, 16, 17. Also purchase and transportation of logs and pulpwood.

Harvey J. Loughead, Consulting Forester, Sareva Place, Grace Station, Asheville, North Carolina.
Territory: Eastern U. S.
Specialization: 3, 4, 12, 13, 16, 17. Also watershed management.

Curtis R. Lytle, Consulting Forester, 11 Bacon Street, Wellsboro, Pennsylvania.
Territory: Pennsylvania and adjoining states.
Specialization: 1, 4, 11, 13, 15, 16, 17, 18. Also farm forestry, timber sale contracts, damage appraisals, sugar-bush management, watershed management, estate woodland management, and agent for absentee timberland owners.

Robert T. MacDougall, Jr., 200 Washington St., Ukiah, California.
Territory: Coast pine and southern redwood regions of California.
Specialization: Timber cruising, forest management, mapping.

Donald K. Maissurow, Consulting Forester, New Haven Avenue, Derby, Connecticut.
Territory: New England.
Specialization: 1, 4, 5, 7, 15, 16, 17, 18. Also landscape forestry.

E. D. Marshall, Consultant in Forest Products, 541 Humason Ave., Lufkin, Texas.
Territory: Texas and surrounding states; Mexico, Central and South America.
Specialization: 3, 11, 13, 19, 20, 21.

Mort May, Timber Cruiser, 6 Cedar St., Eureka, California.
Territory: Northern California.
Specialization: 10, 15, 16, 17.

Earl M. McChesney, Consulting Forester, 57 New York Street, Bangor, Maine.
Territory: Maine, New York.
Specialization: 1, 4, 15, 17, 18. Also personnel work.

Rex D. McCord, Consulting Forester, 703 South Crest Road, Chattanooga, Tennessee.
Territory: North Georgia, north Alabama, east Tennessee.
Specialization: 3, 4, 16, 17.

Thomas A. McFarland, Consulting and Contracting Forester, 60 Holman Avenue, Athens, Georgia.
Territory: Georgia.
Specialization: 2, 4, 10, 15, 16, 17. Also timber, timberland, and farmland broker.

Philip C. Meinzer, Consulting Forester, Route 3, Kokomo, Indiana.
Territory: Indiana.
Specialization: 1, 4, 16, 17, 18.

Fred B. Merrill, Consulting Forester, Box 66, Zachary, Louisiana.
Territory: Mississippi and Louisiana, within 100 miles of Baton Rouge.
Specialization: 4, 5, 6, 7, 11, 13, 16, 17. Also buying and selling timberlands; training estate and company personnel; and Gaylord pulpwood dealer in East and West Feliciana Parishes.

William H. Meyer, Consulting Forester, West Rupert, Vermont.
Territory: Primarily Southwestern Vermont.
Specialization: 2, 3, 4, 11, 16, 17, 18. Also farm management and conservation education.

Raymond M. Miller, Consulting Forester, 322½ E. Fifth Ave., Warren, Pa.
Territory: Pennsylvania, New York, Ohio.
Specialization: 4, 16, 17. Also timber and lumber marketing service.

William F. Milliken, Timberland Consultant, Box 191, Williston, South Carolina.
Territory: South Carolina, eastern Georgia.
Specialization: 3, 4, 6, 11, 13, 15, 16, 17, 18. Also sustained yield plans and contract tree planting; timberland agent for absentee timberland owners.

William J. Mills, Forest Engineer, 201 Volunteer Building, Chattanooga 2, Tennessee.
Territory: Southeastern states, Mexico.
Specialization: 3, 4, 11, 13, 15, 16, 17.

Malcolm A. Milne, Consulting Forester and Landscape Engineer, 433 Clay Avenue, Rochester, New York.
Territory: Central and western New York.
Specialization: 1, 5, 7, 18. Also landscaping, estate development and management, and forest recreation.

R. B. Milne, Consulting Forester, Box 371, Petersburg, Virginia.
Territory: Eastern states; all forest types.
Specialization: 3, 4, 10, 16, 17.

Stuart Moir, Forest Counsel, Western Forestry and Conservation Association, 712 U. S. National Bank Building, Portland 4, Oregon.
Territory: Western states.

Wm. Mollenhauer, Jr., Landuse Consultant, 186 West Avenue, Pitman, New Jersey.
Territory: New Jersey.
Specialization: 4. Also flood and erosion control; ecological surveys of plant and animal relations in forest and rural areas; economic and social surveys of forest and rural areas, including labor relations.

Robert Moore, Consulting Forester, Danville, Pennsylvania.
Territory: Not restricted.
Specialization: 2, 3, 4, 6, 8, 10, 11, 13, 15, 16, 17, 18, 19. Also bankruptcy cases, trade association work, coal lands, trusteeship cases, litigation and damage claims, estate problems.

W. Morris Morgan, Consulting Forester, Tennessee Valley Forest Managers, Inc., Box 511, Athens, Tennessee.
Territory: Southeastern U. S.
Specialization: 4, 16, 17. Also operational management of forest properties, and custom sawing.

R. A. Morin, Consulting Forester, 2532 Sunset Ave., Greenville, N. C.
Territory: Northeast North Carolina.
Specialization: 4, 13, 16, 17, 18. Also growth studies, timber marking and marketing, and agent for absentee timberland owners.

George W. Morrill, Jr., Consulting Forester, 13½ South Spring Street, Concord, New Hampshire.
Territory: New Hampshire, Maine, Vermont.
Specialization: 4, 13, 15, 16, 18. Also landscaping, forest recreation, and beautification.

Charles H. Moyer, Consulting Forester, R.F.D. #2, Newfield, New York.
Territory: Northeast.
Specialization: 4, 10, 15, 16, 17.

National Timber Consultants, Box 497, Salem, Missouri.
Consultants: Ed Woods, Charles Kirk.
Territory: Central and southern states.
Specialization: Management information, land appraisal, and valuation, mapping and estimating.

A. Z. Nelson, Consulting Forester, New Ipswich, New Hampshire.
Territory: U. S., Canada, Alaska.
Specialization: 2, 4, 8, 11, 16, 17.

New England Forest Industries, Inc., 3 North State Street, Concord, New Hampshire.
Consultants: Walter L. Koenig, Concord, N. H.; Dr. Gordon M. Day, Contoocook, N. H.; Richard L. Johnston, Center Harbor, N. H.; Arthur Peabody, Center Sandwich, N. H.; Hans K. Nielsen, Jr., Boscawen, N. H.
Territory: New England.
Specialization: Planting, selective logging, appraisals, forest land brokerage, intermediate cuttings, marking, surveys-cruises.

New England Forestry Foundation, 3 Joy Street, Boston 8, Massachusetts.
Consultants: Harris A. Reynolds, Secretary; J. Milton Attridge, Acting Chief Forester; Allison F. Catheron, II, Stanley B. Coville, Herbert L. Crafts, Walter W. Dwyer, Jr., Frederic P. Elwert, Richard H. Illinik, Kenneth E. Jones, Kenneth F. Lancaster, William N. Lane, Frederick J. McLeary, Allan W. Plumb, Donald R. Popema, Harrison S. Ripley.
Territory: New England.
Specialization: 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, 18.

New England Silvicultural Service, Reading, Vermont.
Consultant: Fred M. Hunt.
Territory: Central New England.
Specialization: 4, 10, 15, 16, 17, 18. Also management of pine plantations.

Samuel A. Newman, P. O. Box 156, Everett, Washington.
Territory: Washington.
Specialization: 8, 10, 15, 16, 17. Also aerial surveys and forest litigation.

Leon A. Nix, Consulting Forester and Logging Expert, Port Credit, Ontario, Canada.
Territory: Not limited.
Specialization: 2, 3, 4, 6, 10, 13, 15, 16, 17. Also farm woodlot management.

Northeast Forestry Service, 262 Blauvelt Road, Pearl River, New York.
Consultant: Stanley Mesavage.
Territory: Northeast.
Specialization: 3, 4, 10, 11, 15, 16, 17.

Ernest Nutting & Co., Consulting Forester, Box 51, Camden, South Carolina.
Associate: Royal E. Cummings.
Territory: South Carolina.
Specialization: 4, 6, 13, 15, 16, 17, 18.

Wm. B. Osborne, Consulting Forester, 2167 N. W. Marshall Street, Portland, Oregon.
Territory: Western states, British Columbia.
Specialization: 6, 16.

W. R. Owens, Jr., Consulting Forester, Route 4, Box 48, Nacogdoches, Texas.
Territory: Texas, Louisiana.
Specialization: 4, 10, 12, 13, 15, 16, 17, 18.

Charles R. Page, Jr., Forest Land Manager and Consultant, 415 Friar Road, Chattanooga 11, Tennessee.
Territory: Southeastern states.
Specialization: 4, 7, 11, 15, 16, 17, 18.

Penta Post and Treating Co., Tuttle, Idaho.
Consultant: Vernon Ravenscroft.
Territory: Idaho.
Specialization: 1, 2, 3, 4, 6, 14, 15, 16, 17, 18, 19.

Pomeroy & McGowin, Forest Managers, Monticello, Arkansas and Chapman, Alabama.
Consultants: L. K. Pomeroy, Julian F. McGowin (S.A.F. Associate Member), Z. W. White, T. R. Scott, Jr., W. V. Gandy, D. W. Samson.
Territory: Southern states, South America.
Specialization: 4, 8, 11, 13, 16, 17, 18. Also aerial forest surveys.

Pond & Moyer, Inc., Co., Consulting Foresters, 107 Homestead Road, Ithaca, New York.
Consultant: James D. Pond.
Territory: New York and Northeast, Latin America; northern hardwoods, spruce-fir, central hardwoods, tropical woods.
Specialization: 1, 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 18, 21.

Prentiss & Carlisle Company, Inc., Timberland Service—Engineers, 107 Court Street, Bangor, Maine.
Consultants: George T. Carlisle, Philip P. Clement, Robert W. Averill, George D. Carlisle, Edward K. Brann.
Territory: United States, Canada.
Specialization: 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 18.

John G. Rawls Co., Consulting Foresters, 408 Rogers Avenue, Macon Georgia.
Consultant: John G. Rawls (S.A.F. Affiliate Member).
Territory: Southeast.
Specialization: 10, 12, 13, 15, 16, 17.

Arthur D. Read, Consulting Forester, 308 Riggs Street, West Monroe, Louisiana.
Territory: Southern pine and hardwood region.
Specialization: 4, 15, 16, 17, 18.

Reed Forestry & Equipment Co., Consulting Foresters, Box 102, Smithfield, North Carolina.
Consultant: R. E. Reed.
Territory: Southeastern states; all forest types.
Specialization: 2, 3, 4, 11, 13, 15, 16, 17, 18. Also custom sawing and sale of forestry equipment.

Tom Reimer, Consulting Forester, 1311 Whitney Ave., Albany, Georgia.
Territory: Georgia, Florida, Alabama.
Specialization: 2, 3, 4, 6, 10, 12, 13, 15, 16, 17, 18.

Charles Wm. Roberts, Route 2, Box 324-A, New Bern, North Carolina.
Territory: Eastern North Carolina.
Specialization: 3, 4, 13, 15, 16, 17. Also timber damage appraisal.

Robinson Improvement Company, St. Augustine National Bank, St. Augustine, Florida.
Consultant: Allen D. Nease.
Territory: Florida and South Georgia.
Specialization: 2, 3, 4, 5, 6, 7, 9, 12, 13, 15, 16, 17, 18.

Donald C. Rock, Consulting Forester and Engineer, Box 508, New Paris, Indiana.
Territory: Lake states.
Specialization: 2, 4, 8, 10, 11, 13, 15, 16, 17, 18. Registered land surveyor. Timber cruising is a specialty.

Frank I. Rockwell, Consulting Forester and Landscape Architect, 3115 29th Ave. So., Minneapolis, Minnesota.
Territory: Northern and western states, especially Great Lakes and Great Plains regions to West Coast.
Specialization: 1, 3, 4, 5, 6, 7, 8, 9, 14, 15, 16, 17, 18, 19. Also landscape engineering; farm and city forestry; park, farm, and land management, recreational planning.

A. P. Russell, Commercial and Industrial Forester, 11 Maplewood Drive, Sumter, South Carolina.
Territory: Not limited, but principally southern region.
Specialization: 2, 3, 4, 10, 11, 12, 13, 15, 16, 17, 18. Also forest resource surveys for industry, timberland acquisition and sales, contract logging supervising, log scaling and grading.

Sable Mountain Corporation, Rutland, Vermont.
Consultant: Richard C. Rose.
Territory: Central Vermont.
Specialization: 4, 15, 16, 17.

Leslie A. Sample, Consulting Forester, Route 2, Box 237, Shreveport, Louisiana.
Territory: Arkansas, Louisiana, Texas.
Specialization: 3, 4, 5, 6, 7, 13, 14, 15, 16, 17.

Roy Dale Sanders, Visual Education Technician, Rural Route 6, Evrodale, Brainard, Minnesota.
Territory: Unlimited.
Specialization: Forester, wildlife technician, photographer. The entire production supervision of 16 millimeter color educational motion pictures, including script writing, direction, photography, editing, and sound supervision. Also production of all types of color and black and white still picture visual education material.

Sandhill Forestry Company, Route 2, Rockingham, North Carolina.
Consultant: Walter J. Marshburn, Jr.
Territory: Southeastern United States.
Specialization: 3, 4, 6, 13, 16, 17, 18. Also woodland property sales.

Joseph A. Schmidt, Consulting Forester, Box 470, Charleston, South Carolina.
Territory: Southeast.
Specialization: 4, 13, 15, 16, 17. Also growth studies, timber marking.

C. D. Schultz & Co., Inc., Foresters and Engineers, Forest Consultants, 946 White-Henry-Stuart Building, Seattle, Washington.
Consultants: C. D. Schultz, R. D. Schultz.
Territory: Oregon, Washington, California mainly; but no regional limitations.
Specialization: 2, 3, 4, 6, 8, 10, 11, 15, 16, 17, 18, 20.

C. D. Schultz & Co., Ltd., Foresters and Engineers, Forest Consultants, 811 West Hastings Street, Vancouver, British Columbia.
Consultants: C. D. Schultz, R. D. Schultz and 18 members of the Canadian Institute of Forestry.
Territory: British Columbia mainly; but no regional limitations.
Specialization: 2, 3, 4, 6, 8, 10, 11, 15, 16, 17, 18, 20.

Thomas F. Schweigert, Consulting Forester, Walloon Lake, Michigan.
Consultants: Thomas F. Schweigert, George E. Young.
Territory: Michigan.
Specialization: 1, 4, 6, 15, 16, 17, 18. Also contract tree planting; registered land surveyor.

Louis N. A. Seeman, P. O. Box 1021, El Dorado, Arkansas.
Specialization: Timber estimates, timber spotting and selling, timber stand improvement, general forest management on small tracts, forest appraisals.

James R. Simmons, Consulting Forester, 30 Gordon Street, Bel Air, Maryland.
Territory: Eastern states.
Specialization: 2, 3, 4, 10, 11, 13, 14, 15, 16, 17, 18.

William R. Sizemore & Co., Foresters and Surveyors, Tallassee, Alabama.
Consultants: William R. Sizemore, J. Woodrow Deason, John H. Ford, William T. Ogletree.
Territory: Alabama.
Specialization: 2, 3, 4, 8, 11, 13, 15, 16, 17, 18.

Samuel S. Snook, P. O. Box 521, Walterboro, South Carolina.
Territory: South Carolina.
Specialization: 4, 15, 16, 17.

Dean Solinsky, Hobart Bldg., San Francisco 4, California, and Mokelumne Hill, California.
Territory: Northern California.
Specialization: Timberland appraisals, cruising, mapping.

Southeastern Foresters, Forest Consultants, 234 6th Avenue, North, Jacksonville Beach, Florida.
Consultants: Nelson B. Blocker, D. Erie Bradshaw.
Territory: Southeastern U. S.
Specialization: 3, 4, 6, 8, 12, 13, 15, 16, 17, 18. Also timber resource investigations; timberland management; timber and land sales; insurance company representative for loans on forest properties.

Southern Timber Management Service, Home Office, 205 S. 32nd St., Birmingham, Alabama; Branch Office, 404 Montgomery Ave., Sheffield, Alabama.
Consultants: J. M. Bradley, H. E. Murphy; Associates: M. Vickery, J. E. Michel.
Territory: South.
Specialization: 1, 2, 3, 4, 10, 11, 13, 15, 16, 17, 18. Also acting as land agent and forester in charge for private, commercial, and absentee-owned timberlands of all sizes with optional complete timber stand improvement cutting, milling, and T.S.I. operations as a service under contract.

Frank Spearey, Consulting Forester, Licensed State Land Surveyor, P. O. Box 547, Nacogdoches, Texas. Branch office, Rusk, Texas, George K. Goldsberry in charge.
Territory: Gulf States.
Specialization: 4, 15, 16, 17. All phases of land management.

Everett R. Stanford, Consulting Forester, 409 North Atlantic Boulevard, Alhambra, California.
Territory: Southern California; mountain watersheds, recreational areas.
Specialization: 1, 5, 6, 7, 18. Also forest watershed management, erosion control, mountain forest home sites, forest park planning and management, structural pest control.

T. J. Starker and Son, 3755 Van Buren Street, Corvallis, Oregon.
Operating consultants: T. J. Starker, Bruce Starker.
Territory: Oregon.
Specialization: 1, 3, 4, 10, 16, 19, 21.

J. F. Stauss, Consulting Forester, 9 Nowlan Road, Hillcrest, Binghamton, New York.
Territory: Northeast and Canada.
Specialization: 2, 3, 4, 8, 10, 11, 13, 15, 16, 17, 18. Also marketing and other forest products; litigation and damage claims.

Fred Stell, Consulting Forester, Route 2, Box 226-B, Arvada, Colorado.
Territory: Colorado, Wyoming, New Mexico, Kansas, Nebraska.
Specialization: 4, 6, 9, 14, 15, 16, 17, 18.

E. A. Sterling, 39 Lake Avenue, Montrose, Pennsylvania.
Territory: General.
Specialization: 4, 6, 13, 16, 18.

Raymond E. Stevens, Consulting Forester, 419 Lyceum Building, Duluth 2, Minnesota.
Territory: Northern parts of Minnesota, Wisconsin.
Specialization: 4, 15, 16, 17, 18. Also field investigation and forest litigation.

Edward Stuart, Jr., Operating and Consulting Forester, Avalon, Virginia and Hertford, North Carolina.
Territory: Eastern U. S.
Specialization: 2, 3, 4, 10, 11, 13, 14, 15, 16, 17, 18. Also investigations and arbitration of claims; operational management in manufacturing and marketing of forest products.

Richard L. Templin, Jr., 1004 N. W. Hawthorne, Grants Pass, Oregon.
Territory: Southwestern Oregon.
Specialization: Cruising, management, surveying, logging engineering.

Tillinghast & Reed, Consulting Foresters, Clothier, West Virginia, or Madison, West Virginia.
Consultants: John Tillinghast, Clothier, W. Va.; Marvin Reed, Madison, W. Va.
Territory: West Virginia, eastern Kentucky, western Virginia.
Specialization: 3, 4, 6, 15, 16, 17, 18, 19, 20. Timberlands in coal producing areas a specialty; services available on job basis or on annual retainer fee basis.

J. M. Tinker, Registered Forester, 906 E. Rock Springs Road, N. E., Atlanta, Georgia.
Territory: Georgia and Southeast.
Specialization: Cruising and management.

Donnie P. Todd, Jr., Consulting Forester, Box 765, Route 8, Charleston, South Carolina.
Territory: Southeast.
Specialization: 2, 3, 4, 5, 6, 7, 10, 12, 13, 16, 17, 18. Emphasis on aerial photo techniques. Also agent for absentee timberland owners.

Henry H. Tryon, Consulting Forester, 258 Mountain Road, Cornwall-on-Hudson, New York.
Territory: New York and New England.
Specialization: 3, 4, 10, 15, 17, 18. Also specializing in sprout hardwood region.

Turner and Shannon, Registered Surveying—Consulting Forestry, Colwell-Arnold Building, Kittanning, Pennsylvania.
Consultant: Robert B. Shannon.
Territory: Pennsylvania, New York, Ohio, West Virginia.
Specialization: 2, 4, 15, 16, 17, 18. Also timber damage appraisals; farm appraisals; construction layout.

John N. Tyler, Consulting Forester, Box 112, Jamestown, Tennessee.
Territory: Tennessee, Kentucky, and southeast United States.
Specialization: 3, 4, 6, 10, 13, 15, 16, 17, 18. Also forest land management and operation of properties.

Eugene P. Van Arsdel, Forester and Forest Pathologist, 943 E. Lakeside Street, Madison 5, Wisconsin.
Territory: Illinois, Indiana, and Wisconsin.
Specialization: 1, 4, 5, 15, 17, 18. Specializing in economical disease control through environmental modifications.

James M. Vardaman & Company, Morris Building, Laurel, Mississippi.
Consultant: James M. Vardaman.
Territory: Mississippi, southern Alabama, eastern Louisiana.
Specialization: 16, 17. Also own and operate medium-sized tree farm.

J. W. Vinacke, Consulting Forester, P. O. Box 179, Grass Valley, California.
Territory: Pine region of California, Oregon, and Nevada.
Specialization: 4, 14, 15, 16, 17.

Myron S. Wall, Jr., Consulting Forester, 4612 Fegan Way, Sacramento, California.
Territory: California.
Specialization: 2, 3, 4, 6, 7, 10, 11, 15, 16, 17, 18. Also photo interpretation as applied to logging engineering, cruising, and mapping; timber sale supervision; scaling; and timber dispute arbitration.

Wallace Bros. Timber Service, Consulting Foresters and Jackson Lumber Harvester Operator-Dealer, Butler, Georgia and Chamblee, Georgia.
Consultant: W. G. Wallace.
Territory: Southeast.
Specialization: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18. Also custom or contract logging and sawmilling.

Robert D. Washburn, Forestry Consultant, Route 1, Box 461, Marquette, Michigan.
Territory: Upper Michigan, northern Wisconsin.
Specialization: 2, 4, 10, 15, 16, 17. Also land appraisal. Registered surveyor, State of Michigan.

Edward H. Werner, Consulting Forest Engineer, 1223 - 26th Street, Sacramento, California.
Territory: California, southern Oregon.
Specialization: 3, 4, 10, 16. Also timber and log procurement, timber sale and logging contract specifications, state forest practice act regulations, timber trespass, claims, and acquisition of timber and range lands.

J. Atwood Whitman, Consulting Forester, Glendon, North Carolina.
Territory: Southern states.
Specialization: 4, 15, 16, 17, 18. Also forest damage appraisal, growth analysis, timber type maps, and municipal forestry.

S. A. Wilde, Soils Department, University of Wisconsin, Madison 6, Wisconsin.
Territory: Wisconsin, Minnesota, Michigan, Missouri, Illinois, Indiana, Ohio.
Specialization: 18. Including survey of forest tracts, selection of planting sites, management of forest nursery soils.

Richard E. Wilson, 126 Kelvin Place, Ithaca, New York.
Territory: Not restricted.
Specialization: 18. Establishment and care of plantations.

S. Leigh Wilson, Consulting Forester, 857 Congaree Drive, Florence, South Carolina.
Specialization: 3, 4, 16, 17.

Paul T. Winslow, Consulting Forester, Staatsburg, Dutchess County, New York.
Territory: Northeast.
Specialization: 1, 3, 4, 11, 15, 16, 17, 18.

Woodland Managers, P. O. Box 542, Lake City, Florida.
Consultants: Philip J. Moses, General Manager, L. A. Hetrick, K. R. Swinford, E. W. Gemmer.
Territory: Southeastern United States.
Specialization: Aerial photo interpretation, cruising, damage appraisal, forest management planning, forest maps, growth and yield computations, land surveying, land valuation, tree marking, timber marketing, tree planting, insect problems.

J. E. Woodman, Barnett Bank Building, Jacksonville 2, Florida.
Territory: Eastern United States and Canada.
Specialization: 3, 4, 12, 13, 16, 18.

Robert E. Worthington, Consulting Forester, Quilcene, Washington.
Territory: Olympic Peninsula.
Specialization: 2, 10, 15, 16, 17.

James G. Yoho, Consulting Forester, 231 Elm Street, Nacogdoches, Texas.
Territory: Eastern Texas and South in general.
Specialization: 2, 4, 5, 6, 7, 8, 10, 12, 13, 15, 16, 17, 18. Also forest mapping and timber estimating from aerial photographs. Appointments by mail only.

Lawrence W. Zach, Consulting Forester, Route 2, Box 281, Woodburn, Oregon.
Territory. Western Oregon.
Specialization: 4, 15, 16, 17.

E. A. Ziegler, Consulting Forester and Pennsylvania Licensed Land Surveyor, Lewisburg, Pennsylvania.
Territory: Middle Atlantic States and Southeastern States to and including Florida.
Specialization: 2, 3, 4, 6, 8, 12, 13, 15, 16, 17, 18.

The Society of American Foresters

The Society of American Foresters is a professional organization of technically trained foresters. It is a democratic, nonpolitical, nonprofit association of over 9,000 members.

As stated in its Constitution, the objects of the Society are to represent, advance, and protect the interests and standards of the profession of forestry, to provide a medium for exchange of professional thought, and to promote the science, practice, and standards of forestry in America.

Membership in the Society of American Foresters is recognition of a man's professional abilities and attainments. No person can acquire such recognition if it is not deserved.

The Society is governed by a president, vice president, and nine other Council members. Policies established by the Council are translated into action programs which are administered by the executive secretary whose office is in the Mills Building, Washington, D. C.

An annual meeting of the Society includes technical sessions arranged by the eleven Divisions which specialize in forest management, silviculture, private forestry, forest economics, forest products, forest recreation, forest wildlife management, range management, watershed management, public relations, and education. Other features of the meeting include sessions on general topics and a joint conference of the Council and Section delegates.

Sections are regional units of the Society. The United States, its territories, and Canada are divided into 21 Sections which elect their own officers, hold meetings, and conduct appropriate projects and activities. Many Sections have subsidiary units called Chapters which hold informal meetings and field trips to acquaint foresters with each other and with local forestry matters.

The JOURNAL OF FORESTRY is a monthly publication of the Society. Other publications include *Forestry Terminology*, *Fifty Years of Forestry*, *Foresters' Manual* (now in preparation), and others.

Through its publications and meetings the Society provides a medium for the exchange of professional information and promotes cooperation among foresters and with those in allied fields.

By encouraging its members to promote the adoption, use, and improvement of forestry practices, the Society endeavors to extend the benefits of good forestry practices to all timberland owners and users of forest products.

Through the operation of committees, by the functioning of Chapters, Sections, Divisions, and the Council, and by expressions of the membership through referendums, the Society helps establish the policies and standards to be observed by professional foresters.

CONSULTING FORESTERS, CLASSIFIED BY STATES

Consulting foresters are listed below according to the state in which each has headquarters.

Alabama
Glenn O. Antonie
Pomeroy & McGowin
William R. Sizemore & Co.
Southern Timber Management Service

Arkansas
T. F. Grayson and Company
Pomeroy & McGowin
Louis N. A. Seemann

California
Charles H. Bunting
California Foresteering
John D. Coffman
Emanuel Fritz
Hammon, Jensen, and Wallen
Arthur Koehler
Robert T. MacDougal
Mort May
Dean Solinsky
Everett R. Stanford
J. W. Vinacke
Myron S. Wall, Jr.
Edward H. Werner

Colorado
K. J. Helmick
Fred Stell

Connecticut
Connwood, Inc.
Kiefer and Quaile
Donald K. Maissurow

District of Columbia
Albert G. Hall and Associates

Florida
Floyd F. Clark
Rex S. Harper
Douglas F. Horan
T. M. Howerton, Jr.
Joseph C. Kircher
Robinson Improvement Co.
Southeastern Foresters
Woodland Managers
J. E. Woodman

Georgia
Charles F. Evans
G. E. Knapp
The Langdale Company
T. A. Liefeld
Thomas A. McFarland
John G. Rawls Co.
Tom Reimer
J. M. Tinker
Wallace Bros. Timber Service

Idaho
Penta Post and Treating Co.

Indiana
Consulting Foresters
Philip C. Meinzer
Donald C. Rock

Iowa
C. V. Fisk

Kentucky
Dudley C. Carey

Louisiana
Henry L. Bango
Frank W. Bennett & Assoc.
Inman F. Eldredge, Sr.
Farmcraft Associates, Inc.
Clarence W. Griffith
Ralph W. Hayes
John F. Kellogg
Frank J. Lemieux
Fred B. Merrill
Arthur D. Read
Leslie A. Sample

Maine
Philip T. Coolidge
Stephen L. Jacobs
Earl M. McChesney
Prentiss & Carlisle Company, Inc.

Maryland
L. J. Enright
William E. Garvey
James R. Simmons

Massachusetts
C. P. Cronk
New England Forestry Foundation

Michigan
Forestry Consulting Services
Thomas F. Schweigert
Robert D. Washburn

Minnesota
William T. Cox
Frank I. Rockwell
Roy Dale Sanders
Raymond E. Stevens

Mississippi
Robert K. Boydell
Keith Cranston & Associates
Randle J. Dedeaux
Forestry Suppliers, Inc.
James M. Vardaman

Missouri
National Timber Consultants

Montana
Hamilton D. Hill

New Hampshire
William P. House
H. Thorn King
George W. Morrill, Jr.
A. Z. Nelson
New England Forest Industries

New Jersey
Merton Henry
Wm. Mollenhauer, Jr.

New Mexico
W. T. Doherty

New York
Raymond D. Adolph
Allen W. Bratton
Nelson C. Brown
David B. Cook
David S. Findlay
Edwin H. Francis
David H. Hanaburgh
Hiram L. Henderson
Richard F. Howard
LeRoy W. Huntington
David G. Jennings
Frank E. Karpick
Henry S. Kernan
Paul C. Lemon
Malcolm A. Milne
Charles H. Moyer
Northeast Forestry Service
Pond & Moyer, Inc., Co.
J. F. Stauss
Henry H. Tryon
Richard E. Wilson
Paul T. Winslow

North Carolina
Thos. W. Alexander
T. S. Coile
R. W. Graeber
Alvin B. Hafer
Victor W. Herlevich
Gorham E. Jackson
Ralph S. Johnson
Harvey J. Loughead
R. A. Morin
Reed Forestry & Equipment Co.
Charles Wm. Roberts
Sandhill Forestry Co.
Edward Stuart, Jr.
J. Atwood Whitman

Ohio
William J. Bozett
E. V. Jotter

Oregon
Bigley and Feiss
Brown and Brown
Carl F. Ehelebe
Grant and Evans
Kenneth Wayne Guenther
E. J. Hanzlik
G. W. Hult
R. Wilson Hutchison
Stuart Moir
Wm. B. Osborne
T. J. Starker and Son
Richard L. Templin
Lawrence W. Zach

Pennsylvania
S. Gayley Atkinson
A. Norman Dietrick
W. G. Edwards
Reginald D. Forbes
LeRoy Frontz
Nathan B. Golub
T. A. Hardes Lumber Co.
Curtis R. Lytle
Raymond M. Miller
Robert Moore
E. A. Sterling
Turner and Shannon
E. A. Ziegler

Rhode Island
Monterey L. Holst

South Carolina
John R. Allison
Milton Applefield
Bishop Brothers
Jack C. Blakeney
Lewis M. Boice
Gordon Bowker
Lucas M. Dargan
Forestry Aids
Giles G. Hall
James L. Huff
Robert F. Knoth & Company
William F. Milliken
Ernest Nutting
A. P. Russell
Joseph A. Schmidt
Samuel S. Snook
Donnie P. Todd
S. Leigh Wilson

Tennessee
Green's Timber Service
M. E. Jelley
Frank M. Langford
Rex D. McCord
William J. Mills
W. Morris Morgan
Charles R. Page, Jr.
H. C. Scott
John N. Tyler

Texas
L. L. Bishop
N. D. Canterbury
Farmcraft Associates, Inc.
George M. Fisher
E. D. Marshall
W. R. Owens, Jr.
Frank Spearey
James G. Yoho

Vermont
Halsey M. Hicks
William H. Meyer
New England Silvicultural Service
Sable Mountain Corporation

Virginia
F. A. Friend, Jr.
Charles M. Genaux
Stuart G. Keedwell
R. B. Milne
Edward Stuart, Jr.

Washington
William A. Eastman, Jr.
Robert W. Jones
L. D. Lloyd
Samuel A. Newman
C. D. Schultz & Co., Inc.
Robert E. Worthington

West Virginia
John F. Tillinghast

Wisconsin
George Banzhaf & Company
R. C. Fraunberger
Eugene P. Van Arsdel
S. A. Wilde

Canada
Belanger and Bourget
F. J. G. Johnson
John D. Gilmour
Leon A. Nix
C. D. Schultz & Co., Ltd.

Africa
Nils B. Eckbo

Foresters' Code of Ethics

Adopted November 12, 1948

The purpose of these canons is to formulate guiding principles of professional conduct for a forester in his relations with other foresters, with his employers, and with the public. The observance of these canons secures decent and honorable professional and human relationships, establishes enduring mutual confidence and respect, and enables the profession to give it maximum service.

Professional Life

1. The professional forester will utilize his knowledge and skill for the benefit of society. He will cooperate in extending the effectiveness of the forestry profession by interchanging information and experience with other foresters, and by contributing to the work of forestry societies, associations, schools, and publications.

2. He will advertise only in a dignified manner, setting forth in truthful and factual statements the services he is prepared to render for his prospective clients and for the public.

Relations with the Public

3. He will strive for correct and increasing knowledge of forestry and the dissemination of this knowledge, and will discourage and condemn the spreading of untrue, unfair, and exaggerated statements concerning forestry.

4. He will not issue statements, criticism, or arguments on matters connected with public forestry policies, without indicating, at the same time, on whose behalf he is acting.

5. When serving as an expert witness on forestry matters, in a public or private fact finding proceeding, he will base his testimony on adequate knowledge of the subject matter, and render his opinion on his own honest convictions.

6. He will refrain from expressing publicly an opinion on a technical subject unless he is informed as to the facts relating thereto, and will not distort or withhold data of a substantial or other nature for the purpose of substantiating a point of view.

Relations with Clients, Principals, and Employers

7. He will be loyal to his client or to the organization in which he is employed and will faithfully perform his work and assignments.

8. He will present clearly the consequences to be expected from deviations proposed if his professional forestry judgment is overruled by nontechnical authority in cases where he is responsible for the technical adequacy of forestry or related work.

9. He will not voluntarily disclose information concerning the business affairs of his employers, principals, or clients, which they desire to keep confidential, unless express permission is first obtained.

10. He will not, without the full knowledge and consent of his client or employer, have an interest in any business which may influence his judgment in regard to the work for which he is engaged.

11. He will not, for the same service, accept compensation of any kind, other than from his client, principal, or employer, without full disclosure, knowledge, and consent of all parties concerned.

12. He will engage, or advise his client or employer to engage, other experts and specialists in forestry and related fields whenever the client's or employer's interests would be best served by such actions, and will cooperate freely with them in their work.

Relations with Professional Foresters

13. He will at all times strive to protect the forestry profession collectively and individually from misrepresentation and misunderstanding.

14. He will aid in safeguarding the profession against the admission to its ranks, of persons unqualified because of lack of good moral character or of adequate training.

15. In writing or in speech he will be scrupulous to give full credit to others, in so far as his knowledge goes, for procedures and methods devised or discovered and ideas advanced or aid given.

16. He will not intentionally and without just cause, directly or indirectly, injure the reputation or business of another forester.

17. If he has substantial and convincing evidence of unprofessional conduct of a forester, he will present the information to the proper authority for action.

18. He will not compete with another forester on the basis of charges for work by underbidding through reduction of his quoted fee after being informed of the fee quoted by a competitor.

19. He will not use the advantages of a salaried position to compete unfairly with another forester.

20. He will not attempt to supplant another forester in a particular employment, after becoming aware that the latter has been definitely engaged.

21. He will not review the work of another forester, for the latter's employer, without the other's knowledge, unless the latter's connection with the work has been terminated.

22. He will base all letters of reference or oral recommendation on a fair and unbiased evaluation of the party concerned.

23. To the best of his ability he will support, work for, and adhere to the principles of the merit system of employment.

24. He will not participate in soliciting or collecting financial contributions from subordinates or employees for political purposes.

25. He will uphold the principle of appropriate and adequate compensation for those engaged in forestry work, including those in subordinate positions, as being in the public interest and maintaining the standards of the profession.

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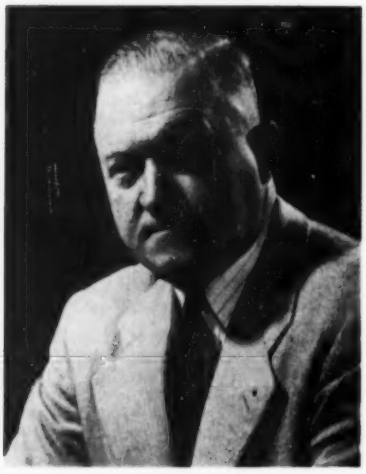
Forestry News

Herr Elected V.P. in Brown Co.

C. S. Herr has been elected vice-president in charge of woods operations in the United States for Brown Company, according to an announcement made by Laurence F. Whittemore, president and chairman of the Board of Brown Company and Brown Corporation. Mr. Herr was elected to his new position at the last meeting of the company's board of directors held recently in Toronto, Canada.

Mr. Herr joined Brown Company as chief forester in 1943, and in 1945 was named resident woods manager.


C. S. HERR

His experience in forestry and woodland operations is extensive. He has served with the U. S. Forest Service in New Hampshire and Pennsylvania, and served for twelve years as an extension forester for northern New Hampshire. Immediately prior to joining Brown Company, Mr. Herr served in Washington, D. C. with the War Production Board on pulpwood production problems.

He is now serving as president of the New Hampshire Timberland Owners Association and as chairman of the Governor's Forest Policy Committee for New Hampshire. Mr. Herr is exceedingly well known in his field and is active in many organizations throughout the country. A member of the Society of American Foresters, he was vice-president during 1950-1951.

Born in Maytown, Pa., Mr. Herr received his forestry degree from Pennsylvania State College in 1925 and his graduate degree from Harvard University in 1930.

Ford Foundation Advisory Group Plans Resources Conference

A citizens' conference on the conservation and development of natural resources to be held in Washington in cooperation with the White House next March — the first of its scope since 1908—was announced recently by Horace M. Albright, president of Resources for the Future, Inc., a new nonprofit corporation established to support education and research in this field.

The corporation which will organize and conduct the conference, Mr. Albright said, will undertake "long-range programs of research and education to assure the resources essential to the progress, vigor, and security of the nation."

Mr. Albright pointed to the recent report of the Paley Materials Commission, and to the earlier report of the Water Policy Commission and related studies by the Hoover Commission, as illuminating the materials and resource problems and giving timeliness to steps by private citizen groups to meet it.

Resources for the Future was established by a committee of citizens which accepted an invitation from The Ford Foundation to serve as an advisory group on resources, to assist the officers of the foundation in planning a program, and to work in the field of research and education for resources development and conservation. After considering the projected citizens' conference as one method of assisting the education of citizens on the resources problem, the committee approached both candidates for the presidency, as well as the White House, and were assured of their support for the project. After the election this support was reaffirmed by the President and the President-elect.

Officers of Resources for the Future, Inc. are Mr. Albright, president; Charles W. Eliot, executive director, and Elmer A. Hennig, secretary-treasurer. Offices of the new organization will be at the Cafritz Building, 1625 Eye Street, Washington, D. C.

Eisenhower Assistant Member of Society

Governor Sherman Adams of New Hampshire, Assistant to the President to coordinate White House business in the Eisenhower administration, has been a member of the Society of American Foresters since 1930. He was elected to full Membership in 1939.

Governor Adams was born in East Dover, Vt., in 1899, and graduated from Dartmouth College in 1920 after service in the Marine Corps in 1918. After graduation he started as a lumberjack with the Black River Lumber Company, Healdville, Vt., a subsidiary of The Parker-Young Company, Lincoln, N. H. and rose steadily in that organization, becoming manager of timberland and lumber operations in 1928.

In 1940 he entered politics to be elected to the New Hampshire House of Representatives where he served two terms. A delegate to the Republican National Convention in 1944, he was elected to the 79th Congress in that year. After being defeated for the G.O.P. nomination as governor in 1946, he was nominated and elected in 1948 and again in 1950. In 1951 his support helped Eisenhower carry the New Hampshire primary, and he acted as Eisenhower's "chief of staff" in the 1952 campaign.

Governor Adams is a director of the Northeastern Lumber Manufacturing Association and of the New England Council.

Hardwood Research Foresters Set Up Quality Index Standards

A conference of research workers in hardwood forestry recently held at Purdue University, agreed on standard bases for the computation of hardwood quality indices for measuring log and tree quality.

Sponsored jointly by the Purdue University Agricultural Experiment Station, the Society of American Foresters, and the Forest Products Research Society, the conference was attended by nearly thirty research men representing all sections of the hardwood-producing areas of the eastern United States.

The standards, which the conference suggested be honored in all ensuing hardwood forest research or forest management activity, are:

1. The base or reference lumber grade is Number One Common.

2. The base or reference lumber thickness is one-inch (4/4).

3. Until further notice, grade price relatives will be calculated (in any marketing area) from average lumber prices existing during the base period of five years, 1947-1951.

Proceedings of the conference, including all papers and discussions, will be published in the near future.

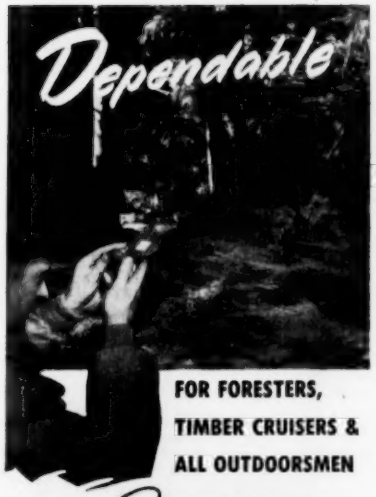
George H. Plumb Appointed To Virginia Forest Service Post

Dr. George H. Plumb has been named first chief of the Virginia Forest Service's newly established division of Forest Insect and Disease Investigation, working under State Forester George W. Dean.

GEORGE H. PLUMB

Formerly assistant entomologist and research associate with the Connecticut Agricultural Experiment Station, Dr. Plumb is the author of a number of studies on forest and shade tree insect pests. In 1945-1946 he was a consultant on the problem of scale insect infestation of the Bermuda cedar. A native of New York, he was graduated from St. Lawrence University in 1931 and received the Ph.D. from Yale School of Forestry in 1945.

The new division was set up in accordance with the provisions of the Virginia General Assembly's Forest Insect and Disease Act of 1952, which assigns to the state's Forest Service authority and responsibility for investigating insects and diseases menacing stands of forest trees, as well as that for planning and demonstrating control measures as a public service.



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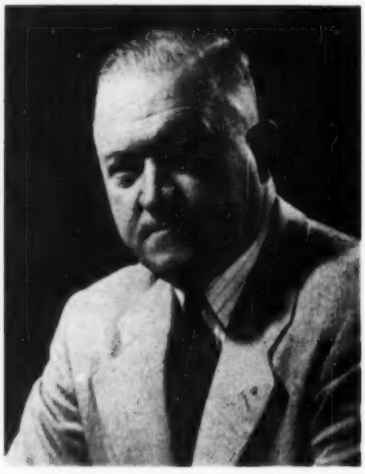
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The corporation which will organize and conduct the conference, Mr. Albright said, will undertake "long-range programs of research and education to assure the resources essential to the progress, vigor, and security of the nation."

Mr. Albright pointed to the recent report of the Paley Materials Commission, and to the earlier report of the Water Policy Commission and related studies by the Hoover Commission, as illuminating the materials and resource problems and giving timeliness to steps by private citizen groups to meet it.

Resources for the Future was established by a committee of citizens which accepted an invitation from The Ford Foundation to serve as an advisory group on resources, to assist the officers of the foundation in planning a program, and to work in the field of research and education for resources development and conservation. After considering the projected citizens' conference as one method of assisting the education of citizens on the resources problem, the committee approached both candidates for the presidency, as well as the White House, and were assured of their support for the project. After the election this support was reaffirmed by the President and the President-elect.

Officers of Resources for the Future, Inc. are Mr. Albright, president; Charles W. Eliot, executive director, and Elmer A. Hennig, secretary-treasurer. Offices of the new organization will be at the Cafritz Building, 1625 Eye Street, Washington, D. C.

Eisenhower Assistant Member of Society

Governor Sherman Adams of New Hampshire, Assistant to the President to coordinate White House business in the Eisenhower administration, has been a member of the Society of American Foresters since 1930. He was elected to full Membership in 1939.

Governor Adams was born in East Dover, Vt., in 1899, and graduated from Dartmouth College in 1920 after service in the Marine Corps in 1918. After graduation he started as a lumberjack with the Black River Lumber Company, Healdville, Vt., a subsidiary of The Parker-Young Company, Lincoln, N. H. and rose steadily in that organization, becoming manager of timberland and lumber operations in 1928.

In 1940 he entered politics to be elected to the New Hampshire House of Representatives where he served two terms. A delegate to the Republican National Convention in 1944, he was elected to the 79th Congress in that year. After being defeated for the G.O.P. nomination as governor in 1946, he was nominated and elected in 1948 and again in 1950. In 1951 his support helped Eisenhower carry the New Hampshire primary, and he acted as Eisenhower's "chief of staff" in the 1952 campaign.

Governor Adams is a director of the Northeastern Lumber Manufacturing Association and of the New England Council.

Hardwood Research Foresters Set Up Quality Index Standards

A conference of research workers in hardwood forestry recently held at Purdue University, agreed on standard bases for the computation of hardwood quality indices for measuring log and tree quality.

Sponsored jointly by the Purdue University Agricultural Experiment Station, the Society of American Foresters, and the Forest Products Research Society, the conference was attended by nearly thirty research men representing all sections of the hardwood-producing areas of the eastern United States.

The standards, which the conference suggested be honored in all ensuing hardwood forest research or forest management activity, are:

1. The base or reference lumber grade is Number One Common.

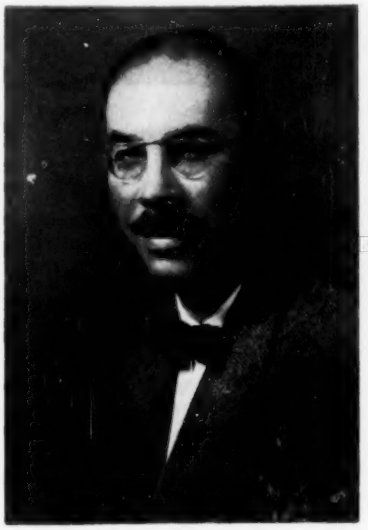
2. The base or reference lumber thickness is one-inch (4/4).

3. Until further notice, grade price relatives will be calculated (in any marketing area) from average lumber prices existing during the base period of five years, 1947-1951.

Proceedings of the conference, including all papers and discussions, will be published in the near future.

George H. Plumb Appointed To Virginia Forest Service Post

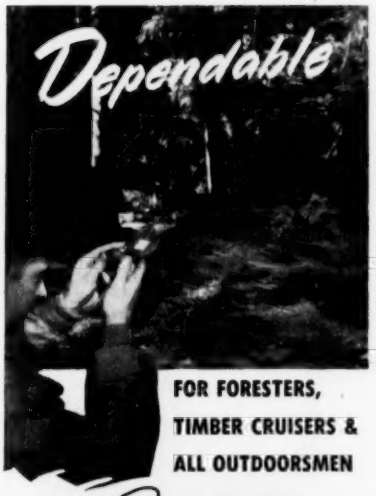
Dr. George H. Plumb has been named first chief of the Virginia Forest Service's newly established division of Forest Insect and Disease Investigation, working under State Forester George W. Dean.



GEORGE H. PLUMB

Formerly assistant entomologist and research associate with the Connecticut Agricultural Experiment Station, Dr. Plumb is the author of a number of studies on forest and shade tree insect pests. In 1945-1946 he was a consultant on the problem of scale insect infestation of the Bermuda cedar. A native of New York, he was graduated from St. Lawrence University in 1931 and received the Ph.D. from Yale School of Forestry in 1945.

The new division was set up in accordance with the provisions of the Virginia General Assembly's Forest Insect and Disease Act of 1952, which assigns to the state's Forest Service authority and responsibility for investigating insects and diseases menacing stands of forest trees, as well as that for planning and demonstrating control measures as a public service.



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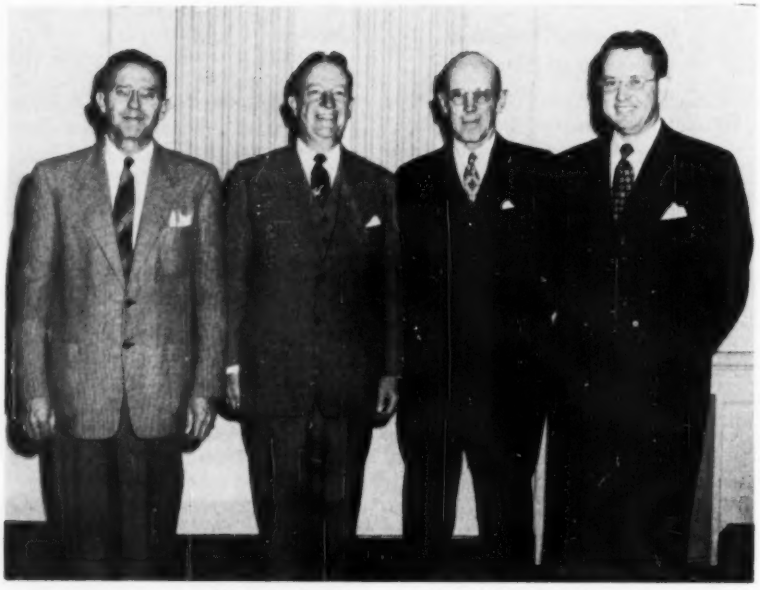

NEW OFFICERS of the National Lumber Manufacturers Association, elected at the association's annual meeting held November 11-15 in Washington, D. C., are shown with NLMA Executive Vice President Leo V. Bodine (far right). Left to right: First Vice President John R. Bemis, president, Ozan Lumber Company, Prescott, Ark.; Chairman of the Board John B. Veach, president, Hardwood Corporation of America, Asheville, N. C.; and President R. R. Macartney, manager, Weyerhaeuser Timber Company, Klamath Falls, Ohio.

Forest Survey of Tennessee Shows Overcutting of Sawtimber

Almost half the land in Tennessee is growing timber, according to a newly completed forest survey released recently by State Forester Carl I. Peterson and Harold L. Mitchell, director of the U. S. Forest Service's Southern Experiment Station, New Orleans.

Conducted by the Experiment Station in cooperation with the Tennessee Division of Forestry and the Tennessee Valley Authority, the survey indicates that although merchantable trees of poletimber size and larger are growing faster than they are being used, sawtimber trees, upon which the state's 2,900 wood-using plants depend heavily, are being cut faster than they are growing.

Forests cover 12,600,000 acres of the state's total land area of 26,900,000 acres, the survey report shows. Its supply of all merchantable trees of poletimber size or larger totals 5 billion cubic feet while volume in sawtimber trees is 16 billion board feet. The trees are chiefly hardwoods, mainly oaks, hickories, gums, and yellow-poplar. Softwoods, although mostly southern pines, include cedar, cypress, white pine, and hemlock.

Tennessee's commercial forests grow 244 million cubic feet of wood annually in trees of poletimber size or larger, compared to commercial logging of about 209 million cubic feet in 1949. The drain on sawtimber trees in 1949, on the other hand, totaled 1,013 million board feet, against a growth of only 877 million board feet. The survey also reveals a more serious overcut of softwood than of hardwood sawtimber.

The detailed report of the survey findings may be secured from the State Forester's office at Nashville, or from the Southern Forest Experiment Station, 704 Lowich Building, New Orleans 13, Louisiana.

Superintendent and Historian Named for Carver Monument

Arthur Jacobson, a district park ranger in Yellowstone National Park for some years, and Robert F. Fuller, of Joplin, Mo., have entered on duty as superintendent and historian respectively at George Washington Carver National Monument, near Diamond, Mo.

Jacobson, a junior member of the S.A.F., is the monument's first superintendent. A Yellowstone National Park employee almost continuously since 1920, he has had wide experience in forest protection, wildlife management, and personnel administration. He was born in Albert Lea, Minn., attended the University of Montana, and served in the Army in 1918-1919.

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National Forest Timber Cut Reaches New High

The volume and value of timber cut on national forests for the three months ending September 30 exceeded that for any other single quarter on record, the U. S. Forest Service announced recently.

Approximately 1,627,800,000 board feet of timber was cut from national forests during the quarter ending September 30, an increase of 10 percent over the 1,470,678,000 board feet cut during the same period a year ago. The previous record volume was 1,482,000,000 board feet during July-September 1950.

The value of the timber cut during the quarter ending September 30 reached $22,715,496 as compared to $18,772,893 for the same period last year. Previous record value was $19,360,000 during October-December 1951.

Alabama Forest Survey To Be Speeded Up

The Alabama Department of Conservation and several private companies have agreed to help the U. S. Forest Service speed up its current forest survey of the state. H. L. Mitchell, director of the Southern Forest Experiment Station at New Orleans which is chiefly responsible for the survey, estimated that the job can be completed and reports made by mid-1953, two full years ahead of the present schedule.

State Forester J. M. Stauffer said that the Alabama Forestry Division will supply five or six foresters to be chiefs of the two-man cruising teams to make the accelerated survey. Seven or eight more party chiefs will be loaned by private companies. The Coosa River Newsprint Company, the Gulf States Paper Corporation, Hollingsworth and Whitney Company, and the St. Regis Paper Company have announced their cooperation.

The present survey began in May 1951. Thirty counties, all in the southern part, still remain to be inventoried.

Mitchell said that he expects the field work to be completed by February or March. It will take the Southern Forest Experiment Station about four months more to tabulate and publish the information gathered.

Stauffer noted that the last forest survey was finished in 1936, at which time almost three-fifths of the land in Alabama was in forest, but that conditions have changed rapidly almost everywhere in the state since then.

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Maine to Celebrate Golden Anniversary

The 50th anniversary of the establishment of the forestry department at the University of Maine will be observed on October 1-2, 1953, Professor Gregory Baker, chairman of a committee appointed to prepare the anniversary program has announced.

Other members of the planning committee appointed by Professor Robert I. Ashman, head of the forestry department, are Assistant Professors Henry Plummer, Gordon Chapman, and Harold E. Young. All members of the committee are alumni members of the forestry staff.

The forestry department at the University of Maine was authorized by the Maine Legislature in 1902 and the department admitted its first students in the fall of 1903. Samuel Newton Spring was the first department head. Six students were registered for the first year and four were graduated in 1906. Two of these graduates are still living.

This year Maine's forestry department has an enrollment of 215 students and a staff of 10 faculty members.

Osmose Wood Preserving Co. Employs 30 Foresters

An example of the wide field of employment of professional foresters is given by the Osmose Wood Preserving Company of Buffalo, N. Y. They own no timber, manage no land, and operate no sawmills. Yet they employ over thirty profesional foresters, in every phase of the company's business.

Foresters supervise the treating crews in groundline treating and participate in selling the treatment. Right-of-Way Maintenance Corporation, a wholly owned subsidiary of the company, uses foresters exclusively in developing stable ground cover through plant community management. Trained foresters have been found admirably suited to this work.

Wood preservative manufacture and sale is the primary activity of the company. Here also foresters are active. A forester with graduate work in chemistry heads the research department, a sales manager is a forester, and all Osmose field men, salesmen, and inspectors are foresters.

Osmose reports that not only is professional information on wood and related products a definite advantage, but that foresters have been found capable of doing "a conscientious job with a minimum of supervision."

TODAY ONLY Canada is a net exporter of wood—shipping out more cubic feet than the Canadians themselves consume. South America, Africa, Asia, Oceania are now net importers of wood.

Scholarships in Forestry Offered By St. Regis Paper Company

The St. Regis Paper Company announces its offer of six scholarships in forestry for the academic year 1953-1954, five to Juniors at the schools specified below, and one to be available to a graduate student matriculated in any accredited forestry school in the United States.

The undergraduate scholarships are allocated as follows: one each is open to a student of Alabama Polytechnic Institute, the University of Florida, and the University of Georgia; a fourth will be available to a student either from the University of Washington or Oregon State College; and a fifth will be granted to a qualified applicant enrolled at the University of Maine, the University of New Hampshire, the University of Massachusetts, or the College of Forestry of the State University of New York.

Further information about the undergraduate scholarships may be obtained from heads of schools listed. Graduate students interested should write to A. B. Recknagel, St. Regis Paper Company, 230 Park Avenue, New York 17, N. Y.

Bankers Take to the Woods In Annual Missouri Forest Tour

The 1952 forest tour of the Missouri Bankers Association, given in cooperation with the Missouri Conservation Commission, the University of Missouri, and the Federal Reserve Bank of St. Louis on October 23, drew an attendance of 118 equally divided between the banking and the forestry contingents.

After an inspection of firefighting equipment at Round Spring State Park, the group heard talks during a buffet lunch by C. Lee Harper, president of the Sturgeon State Bank; J. H. Longwell, dean of the University of Missouri's College of Agriculture; Delos C. Johnson, president of the St. Louis Federal Reserve Bank; I. T. Bode, director of the Missouri Conservation Commission, and R. H. Westveld, chairman of the University's forestry department.

Afterwards a tour was made of the Seton Porter Forest under the direction of Ed Woods, Forester-in-

Charge and George O. White, State Forester. In the course of afternoon Mr. Woods, Mr. White, and others discussed various problems of timber management, harvesting, lumber production, wood utilization, and bankers' interest in good forest management.

The annual Banker-Forestry Meeting is part of Missouri's drive to increase productivity of its forest resources by expanding fire protection and good management, and for improving the marketing and increasing the use of state-produced timber products.

Beetle Plague and Windstorms Damage Oregon Douglas-firs

A double-pronged catastrophe struck western Oregon's Douglas-fir forests in 1952, killing more than 10 billion board feet of prime timber. W. D. Hagenstein reported to the interagency membership of the Northwest Forest Pest Action Committee recently that the Douglas-fir beetle teamed up with a record windstorm in spreading destruction across 2 million acres of the state's finest forestlands.

The beetle killed about 1 billion feet of timber, according to Hagenstein, chairman of the group's Douglas-fir beetle subcommittee. Another 9 billion feet was blown over by winds of hurricane velocity in the winter of 1951-1952, and additional losses may run from 2 to 5 billion board feet, his report said.

Much of the blow-down timber, an ideal breeding place, is beetle infested and, Hagenstein told the committee, its salvage should receive top priority, since there is no known effective spray for the pest.

Hagenstein based his report on surveys of timber killed on a 13,500 acre area by the Pacific Northwest Forest and Range Experiment Station and the U. S. Forest Insect Laboratory at Portland, which reveal that the scattered locations of the heaviest blow-down and beetle-kill in roadless wilderness areas presents an exceedingly difficult salvage operation that will be the Oregon Douglas-fir industry's most pressing problem for several years.

He urged loggers and landowners to initiate large-scale salvage programs without delay because timber deteriorates rapidly once attacked by the beetles, and should be taken out as rapidly as roads can be built.

R. L. Furniss, entomologist-in-charge at the U. S. Forest Insect Laboratory in Portland, told the committee that additional heavy killing by the beetle is expected in the next two or three years, and that the situation could worsen still more if winter storms blow down more timber.

Fire in this vast area of dead and dying timber also menaces western Oregon's forests, Hagenstein pointed out, since blow-down is exceptionally heavy along windswept ridges.

Combined efforts of private and public forest agencies are required to develop the essential road system into the most heavily infested areas.

Landowners have been urged to survey property annually to keep posted both on extent of spread of the beetle and additional wind damage.

The Douglas-fir beetle has always been present in the northwestern forests but reached epidemic proportions only when a vast breeding ground was provided by the billions of feet of wind-thrown timber.

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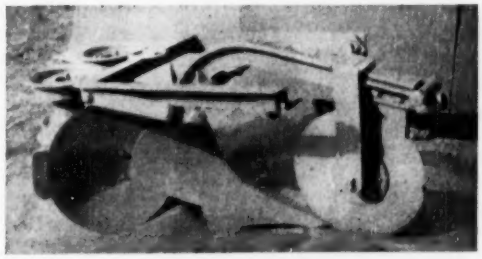

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Conservation Congress Held in Raleigh, North Carolina

A Conservation Congress, held in Raleigh, N. C. from November 17 to November 19 under the sponsorship of the North Carolina Department of Conservation and Development, was generally hailed as having been successful in directing more attention to conservation and wiser use of the Tar Heel State's human and natural resources.

In his keynote address at the beginning of the three-day Congress, which brought together recognized leaders in the fields of human and natural resources, George R. Ross, director of the Department of Conservation and Development, declared:

"The purpose of this Congress is to awaken within departments, institutions, and agencies a consciousness of the immediate need for conservation practices and long-range planning, and to create in the public mind a concept in regard to the wise use of our natural resources."

Conservation and wiser use of North Carolina's more than 18 million acres of woodland came in for a full afternoon of discussion during the Congress. State Forester Fred H. Claridge led the forestry discussions, which featured addresses by members of the Division of Forestry, North Carolina Department of Conservation and Development; faculty members from the School of Forestry, North Carolina State College at Raleigh and the School of Forestry, Duke University, Durham; and by representatives of the Southeastern Forest Experiment Station, U. S. Forest Service, Asheville, N. C.

W. J. Damtoft, vice chairman of the State Board of Conservation and Development and chairman of the board's forestry committee, summarized the discussions relating to forests and forestry. Mr. Damtoft is a vice president of the American Forestry Association and an official of the Champion Paper and Fibre Company, Canton, N. C.

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E. N. Munns Honored

The Soil Conservation Society of America elected E. N. Munns, who retired in 1950 from his post as chief of the Division of Forest Influences, U. S. Forest Service, to fellowship at its annual meeting in October 1952. Mr. Munns has been a Fellow of the Society of American Foresters since 1950.

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Obviously, the Society cannot assume responsibility beyond making it possible for prospective employee and employer to enter into negotiation.

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WOODS EXECUTIVE

A new paper mill now under construction requires an executive with broad experience in large scale woods management and operation. Must possess administrative ability and be capable of organizing and directing all phases of woods program. Experience in pulpwood procurement in southern states is highly desirable. In addition, should have direct experience in management of pulpwood production activities.

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Position Wanted

Forester, agricultural economist, 36, B.S.F., M.F. (Univ. of Mich.), and M.S. (Iowa State College). Four years Soil Conservation Service, Louisiana; 6 months as a surveyor; 5 years forest manager in Cumberland Mts. Desire change of employment next July to teaching, technical assistance and development work, or an administrative position. Nature of work more important than salary.

Box B, Journal of Forestry, Mills Building, Washington 6, D. C.

Forestry Group Holds Conference in Canada

The Western Forestry and Conservation Association held its 43rd international conference December 10 through 12 in Victoria, British Columbia. Theme of the meeting, "Forestry by the Acre," was carried out in discussions of diversified forest production and full crop utilization in the United States and western Canada, forest protection with emphasis on fire prevention, and forest management problems of finance and taxation.

Firefighting devices, maps and radio equipment were exhibited during the conference, and the Association's forest industries communications committee met to discuss developments in radio utilization and progress toward international cooperation in the communications field.

Clyde S. Martin, past president of the Society of American Foresters, is secretary of the group, while C. D. Orchard, of the Canadian Forest Service, is president.

Thorwald A. Carlson 1893-1952

Thorwald A. Carlson, 59, nationally known packaging expert, died October 24, 1952, at a Madison, Wis., hospital. Carlson, who directed far-flung packaging operations of the military forces during World War II as chief of packaging research at the U. S. Forest Products Laboratory, had been ill since midsummer.

A research engineer at the Laboratory for 31 years, Carlson specialized in packaging throughout his career. In 1941, when lend-lease and military overseas shipping problems required great expansion of the Laboratory's research, he organized and directed a staff of experts numbering more than 150 men and women at the peak of World War II. During 1943 he headed a packaging mission to England.

Military experts credit the Laboratory, under Carlson's guidance, with saving millions of dollars' worth of war material from shipping damage, and with so streamlining and reducing bulk of packaging that by the end of the war four ships could transport equipment that earlier had required five. From 1950 until his last illness Carlson worked on military packaging and training problems of the rearmament program.

Carlson, known to his many friends as "Tac," was born July 21, 1893, in Helena, Mont., but spent his boyhood near Yakima, Wash. In 1917 he was graduated from the University of Wisconsin as a chemical engineer and took a job as assistant chemist with the American Smelter and Refining Co. at East Helena. During World War I he served as an army chemist at American University in Washington, D. C., analyzing test methods for new materials.

After the first World War he held a year's fellowship in metallurgical research at the University of Utah where he met and married Mrs. Carlson. After holding research positions with the Anaconda Copper Co. and the American Smelter and Refining Co. he went to the Forest Products Laboratory in September 1921.

Before World War II Carlson was often the Laboratory's only full-time packaging specialist. He worked extensively on design and testing of both wood and fiberboard containers. In 1926 he was granted a public patent for the Carlson score tester, a device for testing fiberboard containers. He also developed methods of determining the causes of damage to packaged goods during shipment, and prepared specifications for various kinds of containers.

All of his life he struggled to overcome prejudices of manufacturers and users against use of all except a few kinds of wood in container manufacture. By publishing the findings of his extensive tests in technical and trade journals, however, he succeeded in bringing many kinds of wood into use, and thus helped to broaden the base of container wood supplies when demand became heavy during wartime.

When World War II ended many of Carlson's staff went into private industry as packaging specialists. To keep them in touch with research developments, however, Carlson was instrumental in organizing them into a packaging club that has met annually in Madison since then.

At the time of his death Carlson was chairman of the committee on shipping containers of the American Society for Testing Materials. He had also served on the container testing committee of the Technical Association of the Pulp and Paper Industry. He was a member of the Forest Products Research Society, the Society of American Foresters, the scientific fraternity, Sigma Xi, and the Madison Technical Club.

He is survived by his wife, his son, Henry L. Carlson, and his daughter, Margery.

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A.F.P.I. Studies Forest Loans

Wise woodland management is receiving recognition in the field of finance, according to a recent Associated Forest Products Industries poll of experts in the farm loan and mortgage departments of large New York and Connecticut insurance companies. Spokesmen for Travelers, Prudential and Equitable said their organizations have embarked on multi-million dollar programs for long-term woodland loans while Officials of Mutual and Metropolitan indicated interest in the woodland loan situation.

Qualifications for timber loans have not yet fallen into a cut-and-dried pattern but conditions governing approval require evidence of such sound management practices as adequate protection against fire, over-grazing, and insect pests, as well as provision for growth and harvest of continuing tree crops, and demonstration of a desire to consolidate indebtedness over a long period. Interest rates on insurance company woodland loans have averaged around 5 percent. While no minimum has been set, insurance firms seem to prefer investments of not less than $25,000.

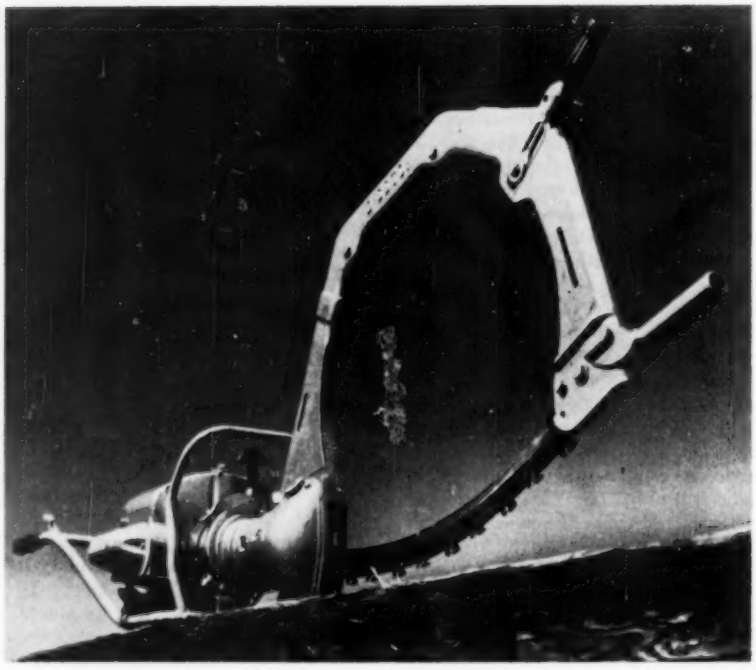
None of the insurance companies now making woodland loans regard absence of fire insurance coverage as a major obstacle. In awarding its first timber loans Prudential bore down heavily on forest fire control and management factors.

Equitable now employs a forester to make appraisals on all applications for timberland loans and expects to make yearly inspections of woodlands on which loans have been made.

Once an applicant wins loan approval the insurance company makes every effort to give the owner wide latitude in carrying out his forestry program.

Forest Soils Short Course

Fifty foresters from industry and public agencies from Oregon, Washington and Wyoming met at Oregon State College on November 6, 7, and 8 for a forest soils short course. Similar to those given previously by the University of Washington, it consisted of illustrated lectures and a field trip to the School of Forestry McDonald Forest. Oregon State College and the Douglas-fir forest soils committee plan to sponsor these short courses annually with a more intensive follow up in the form of field schools also being considered, since the interest in forest soils shown by foresters in the field is encouraging.



A NUMBER of new developments in chain saw design are now available in one tool, a free-flow bow saw recently put on the market by Henry Disston & Sons, Inc., Philadelphia, after a year's field tests. The saw, pictured above, combines 9-horsepower features with a 25-inch bite and cuts more than 1 inch per second on 17-inch seasoned beech logs. An important variation in the chain action suplies the free-flow feature. Instead of riding around the groove of a continuous steel rail the chain, after travelling the 25-inch span of the bite, is carried inside the bow casting on four ballbearing idlers. This reduces friction and speeds up cutting. One idler acts as a tensioning point controlled from a rubber grip handle high on the bow frame which turns easily to increase or decrease chain tension. Another lower handle, for use in two-man operation, folds compactly against the frame when not in use. The cutting principle of the new bow, like the Disston one-man bow, allows the teeth to ride a groove in a 2-inch wide guide rail, the center of which is open. The log pinches itself but not the rail or the upper chain travel, thus reducing the danger of stalling the chain or the engine. Both units are powered by a Mercury gasoline engine. The saw's angular shape is designed for extra strength and balance, and the free-flow principle permits the chain to be slipped or on off the idlers in a few seconds without removing parts or using special tools. Although intended primarily for two-man operation, the saw can be handled by one man in close-cutting situations.

Demmon Elected A.F.A. Director

Elwood L. Demmon, Vice President and Fellow of the Society of American Foresters, has been elected to serve a three year term, ending December 31, 1955, as a director of the American Forestry Association. Five other directors were also chosen in the December 1 election held by that organization: P. R. Camp, Franklin, Va., Leonard G. Carpenter, Minneapolis, Minn., D. C. Everest, Rothchild, Wisc., Karl T. Frederick, New York City, James J. Storrow, Boston, Mass.

Mr. Demmon has been active in A.F.A. affairs. He was in charge of arrangements for the joint annual meeting of The American Forestry Association and The North Carolina Forestry Association in Asheville, N. C. in October 1952. He is director of the Southeastern Forest Experiment Station at Asheville and was elected Vice President of the S.A.F. in 1952.

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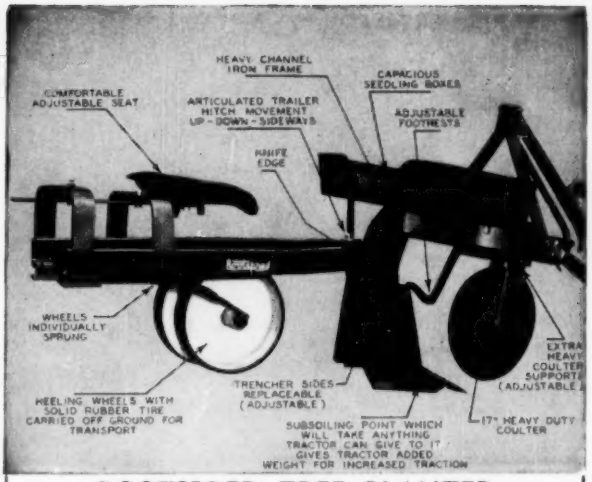
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